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Current Housing Research

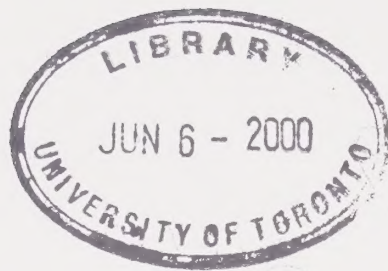
Volume 5, n^os. 1-2





CURRENT HOUSING RESEARCH

Volume 5
Number 1/2
Spring 1998



Issued also in French under the title: ***Recherches courantes sur l'habitation***

Publié aussi en français sous le titre: ***Recherches courantes sur l'habitation***

CURRENT HOUSING RESEARCH ORDER FORM

If you wish to receive any of the completed reports or bibliographies listed, or if you would like to be on the mailing list to receive *Current Housing Research*, please fill out this form and send it to:

Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa ON K1A 0P7
Fax (613) 748-4069
Telephone 1-800-668-2642
Email: chic@cmhc-schl.gc.ca

Completed Reports Requested

Bibliographies Requested

☐ Send copies of above reports/bibliographies

☐ Add my name to your mailing list to receive *Current Housing Research*

Name		
Mailing Address		
City	Province	Postal Code

INTRODUCTION

Welcome to the first issue of "*Current Housing Research*". This publication merges "*Housing Research Quarterly*" and "*Current Housing Technology Initiatives*" and continues the numbering of the "*Housing Research Quarterly*".

Under Part IX of the National Housing Act the Government of Canada provides funds to Canada Mortgage and Housing Corporation to conduct research into the social, economic and technical aspects of housing and related fields.

Current Housing Research is compiled and produced three times a year by the Canadian Housing Information Centre. This publication provides information and access to research which is undertaken and sponsored by the Corporation. It is also available on CMHC's Website at chic@cmhc-schl.gc.ca

The publication contains information on completed research reports, new publications, videos and bibliographies, as well as planned and ongoing research projects. An alphabetical title index of items listed is included at the end for quick reference.

The overall arrangement of "*Current Housing Research*" is by broad subject category. Within each subject category, lists of planned and ongoing projects and completed research reports are described.

Each entry can contain the following elements:

- The project or report title;
- A description of the project or report results;
- The CMHC Project Officer who is managing the project;
- The Division within CMHC which is responsible for the project;
- For External Research Projects, the grant recipient undertaking the research;
- A Contract Identification Number (CIDN);

- The Status of the project: whether the project is in a planned, ongoing or completed phase. "Planned Projects" are those that are not yet underway, but are likely to be initiated in the current year. "Ongoing Projects" refer to research projects which are currently underway. No reports are yet available. Once the project is completed, and a report is available for distribution, it will be listed as a "completed report."

- Whether the report resulting from the research project is available and the address where the completed report can be obtained.

To discuss research projects that are recent or ongoing, please call CMHC General Inquiries at (613) 748-2000 and ask for the CMHC Project Officer identified under each project description.

CMHC's External Research Program

The objective of the CMHC External Research Program (ERP) is to encourage and enable researchers in the private and not-for-profit sectors to put forward and carry out relevant, innovative, and high quality housing research projects. Under the Program, financial contributions are made to support research investigations into important questions, problems, and issues affecting Canadian housing. Housing research priority areas are identified in the "External Research Program Grants for Housing Research Guidelines and Application Form".

Applicants to the External Research Program must be Canadian citizens or have permanent resident status in Canada.

Independent researchers as well as those employed in Canadian universities, institutions, private consulting firms, the professions and the housing industry may apply for these grants.

Full-time students at the graduate or undergraduate level are not eligible to apply. Students may be hired to assist in the conduct of the research, but under no circumstances may they take over responsibility for the direction of the work or the quality of the final report.

Individuals who are full-time federal, provincial or municipal government employees may apply. However, to be eligible, an applicant must provide a letter of support from her/his employer which shows that the proposed research is not part of, and will not interfere with, her/his regular work. CMHC employees are not eligible to receive grants under this Program.

CMHC is interested in receiving applications on topics related to its housing research priority areas. New ideas and innovative approaches in these areas are welcome.

To obtain the booklet outlining the priority research areas, the guidelines and application form for the External Research Program you may contact:

The Administrator
CMHC External Research Program
Research Division
Canada Mortgage and Housing Corporation
700 Montreal Road, Room C7-307
Ottawa, Ontario
K1A 0P7

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NOTE TO INTERNATIONAL CLIENTS

The "*Current Housing Research*" cites research reports and priced publications. **Availability and place of ordering varies with the type of report.**

PRICED PUBLICATIONS

Publications with prices listed in the "*Current Housing Research*" are available for sale to international clients. Prices are payable in Canadian dollars. Orders can be placed and the exact price, with shipping and handling, can be obtained from the following address:

CMHC Information Products
700 Montreal Road
Suite 1000
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2003
Fax: 613-748-2016

RESEARCH REPORTS

Research reports are listed without a price in the "*Current Housing Research*". They are free to Canadian residents. However, to recover some of our distribution costs there is a fee to mail research reports to locations outside of Canada. The price for research reports mailed to destinations in the United States is \$10.00 for each report. The price for research reports mailed to destinations in other countries is \$15.00 for each report. Prices are payable in Canadian dollars. Research reports can be ordered from the address listed below:

Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367
Fax.: 613-748-4069
Internet: chic@cmhc-schl.gc.ca

TECHNICAL RESEARCH

FIRST NATIONS BUILDERS' TRAINING - DEVELOPMENT OF TRAINING MODULES.

In partnership with the Ontario First Nations Technical Services Corporation, the purpose of this project is to provide a set of new and revised technical training materials for First Nations builders training in Ontario. The three day curriculum will include a trainer manual and a participant handbook containing five revised CHBA/CMHC builders series booklets and four new booklets covering wood heat, frost protected slab-on-grade, frost protected shallow wood foundations, as well as the design and installation of two mechanical ventilation kits.

CMHC Project Officer: Tom Kerwin

CIDN: 1750 0300002

Division: Research Division

STATUS: Ongoing Project

ACOUSTICS

ACOUSTICAL PERFORMANCE OF THE PARTY WALLS, FLOOR-CEILING ASSEMBLIES AND EXTERIOR WALL OF THE CLOS ST-ANDRÉ PROJECT.

The objective of this project is to determine the acoustical performance of the party walls, floor-ceiling assemblies and exterior wall of the Clos St-André project.

CMHC Project Officer: Sandra Marshall

CIDN: 0840 0309008

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Hélène Béïque, Groupe Archi Plus inc.
480 St-Laurent Blvd., Suite 303
Montreal, Quebec H2Y 3Y7

AVAILABILITY: Publication not yet available

IMPACT ANALYSIS OF INDUSTRIAL NOISE ON SURROUNDING RESIDENTIAL SECTORS: A PICTURE OF THE SITUATION FOR THE BEAUCE AND QUEBEC AREAS.

The research project is aimed at describing the current situation regarding the impact of industrial noise, with the testing being performed in the Quebec and Beauce areas, two regions where there are many industrial parks adjacent to residential sectors.

CMHC Project Officer: Sandra Marshall

CIDN: 1845 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Jean-Gabriel Migneron, Université Laval
1636 Pavillon Félix-Antoine-Savard
Quebec, Quebec G1K 7P4

AVAILABILITY: Publication not yet available

SOUNDPROOFING PROCURED BY THE EXTERIOR WALLS OF RESIDENTIAL PROJECTS.

The purpose of this project is to determine the acoustical performance of the exterior walls that are most commonly used in the construction industry.

CMHC Project Officer: Ken Ruest

CIDN: 2016 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Michel Morin, MJM Conseillers en Acoustique Inc.
6555 chemin Côte-des-Neiges Road, Suite 440
Montreal, Quebec H3S 2A6

*** NEW ***

AVAILABILITY: Publication not yet available

BASEMENTS, FOUNDATIONS & CRAWLSPACES

BASEMENT WALLS THAT DRY.

Research has shown that finished basement walls, with chronic wetting, produce molds dangerous to human health. This research suggests that no basement with a history of dampness should be finished until the moisture problems are completely remedied. This approach however ignores the reality that few people will spend the several thousand dollars to fix what they perceive to be inconsequential leaks. This project will attempt to find quick-drying basement wall systems, in hopes of being able to recommend these systems for marginal basements. A variety of basement insulation systems are being tested in University of Alberta test huts over the winter and spring of 1997-98. They have been subjected to a mid-wall leak and a 15 cm flood to measure the drainage and drying characteristics.

CMHC Project Officer: Don Fugler

CIDN: 1797 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

IMPROVED BASEMENT PERFORMANCE.

Concerns have been expressed by a number of authorities about the quality of construction of new basements. Technical and cost issues pertaining to the overall performance of poured-in-place concrete basements will be examined. The Canadian Standards Association (CSA), with CMHC and industry support, will improve the standard CAN3-A438-M84: Concrete Construction for Housing and Small Buildings. This standard addresses requirements for poured-in-place concrete basements. Several task groups are working to update this standard.

CMHC Project Officer: Don Fugler

CIDN: 1259 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

LATERAL BRACING OF FOUNDATION WALLS.

The purpose of this project is to assess the adequacy of current concrete foundation wall details to resist lateral pressures of various backfill heights, and to develop a booklet containing cost-effective details for typical situations where additional support is required. The details will be certified by a structural engineer registered in the province of Alberta. The project and development of the booklet will be managed by the Alberta Home Builders' Association on behalf of the Alberta Housing Industry Technical Committee (AHITC). AHITC is an alliance of major organizations (builder associations, Alberta New Home Warranty Program, Municipal Authorities and CMHC) which serves as the technical forum for the residential sector in Alberta.

CMHC Project Officer: Darrel Smith

CIDN: 2039 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

PERFORMANCE GUIDELINE DEVELOPMENT FOR BASEMENT SYSTEMS AND MATERIALS.

This multi-disciplinary, multi-agency study is identifying knowledge gaps in the performance of basement systems. Based on additional research, guidelines will be developed for design, construction and evaluation of basement materials and systems to ensure their durability and long-term performance. Test methods for evaluating the long-term performance of plastic foams and mineral fiber exterior basement wall insulations are being developed. These materials will then be monitored for field performance in demonstration projects. A guide to basement performance is also being drafted.

CMHC Project Officer: Don Fugler

CIDN: 1421 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PROPER CONSTRUCTION OF CRAWL SPACES FOR BUILDERS AND RENOVATORS.

CMHC's research and the 1995 National Building Code differentiate between crawl spaces that are inside or outside the building envelope. This short guide to crawl space construction is meant to be suitable both for Canadian houses and for houses in other countries. It illustrates the basic moisture movement principles in crawl spaces and how best to avoid moisture problems.

CMHC Project Officer: Don Fugler

CIDN: 1932 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

BASEMENTS, FOUNDATIONS & CRAWLSPACES

SLIDE PRESENTATIONS ON TWO FOUNDATION TYPES AND TO MONITOR THE PERFORMANCE OF THE EXAMPLES OF THE TWO FOUNDATION SYSTEMS.

The purpose of this project is to undertake and complete the development of two slide presentations and the monitoring of two foundations over a one-year period.

CMHC Project Officer: Tom Kerwin

CIDN: 1813 030000

Division: Research Division

STATUS: Ongoing Project

BUILDING CODES

REVISION TO "HOUSING AND BUILDING CODES: ISSUES FOR CONSIDERATION".

The objective of this project is to revise the May 1996 discussion paper "Housing and Building Codes: Issues for Consideration" which was prepared for the Federal/Provincial/Territorial Subcommittee on Housing and Building Codes.

CMHC Project Officer: Terry Robinson

CIDN: 1968 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NEW

BUILDING MATERIALS

ADJUST-A-FORM.

The objective of this project is to develop ideas for adjustable, reusable forms. Specifically the project includes the inception to the development of a specific product ready for marketing. The end result will be a product that saves builders time and material and therefore project costs.

CMHC Project Officer: Darrel Smith

CIDN: 1501 0200001

Division: Research Division, Housing Technology Incentives Program

STATUS: Ongoing Project

Grant Recipient: Raymax Construction Limited
1038 Lesperance Road
Tecumseh, Ontario, N8N 1W8

AVAILABILITY: Publication not yet available

BUILDING MATERIALS

FEASIBILITY STUDY OF TOOLS DESIGNED SPECIFICALLY FOR THE REUSED BUILDING MATERIALS INDUSTRY.

The sizable contribution made by construction and renovation activity to the waste streams of Canadian municipal dump sites is an environmental concern. The recently formed, Used Building Materials Association (UBMA), was assembled to respond to the increased activity in the "de-construction" of buildings and the resale of used building materials. This project, undertaken with the UBMA, will identify current volumes of material and methods of removal, the historic use of fasteners, the reuse of used materials in the house of the future, and most importantly, identify tools which would speed and improve salvage methods.

CMHC Project Officer: Cate Soroczan

CIDN: 1892 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

INFORMATION ON DURABILITY AND SERVICE LIFE OF BUILDING ELEMENTS AND EQUIPMENT.

A Delphi project will be undertaken to collect information from property managers, property management firms and experts in differing fields such as ventilation systems, elevators, walls, parking garages, etc., to determine, from their experience, the service life of these elements. The Ontario Rent Control may use the results as a starting point on life expectancy information. The study may also provide data on building elements which in some cases would have low or high durability variances. Follow-up research could then be undertaken to investigate why those building elements have these high variances.

CMHC Project Officer: Ken Ruest

CIDN: 1915 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

MATERIALS FOR INCREASING THE VOLUME OF USED BUILDING MATERIALS IN CANADIAN CONSTRUCTION.

The purpose of this project is to prepare a paper outlining issues surrounding increasing the volume of used building materials in Canadian construction.

CMHC Project Officer: Peter Russell

CIDN: 1892 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BUILDING MATERIALS

PERFORMANCE OF BOX BEAMS.

The objective of this project is to review the design specifications, production, assembly, and testing/monitoring criteria for box beams, and finalize the design and details of production and testing and monitoring protocol.

CMHC Project Officer: Glynis Kossatz

CIDN: 1176 0200001,
1348 0200001

Division: Research Division, Housing Technology Incentives Program

STATUS: Ongoing Project

Grant Recipient: Art Wloski
4133 Northcliffe Avenue
Montreal, Quebec, H4X 3L2

AVAILABILITY: Publication not yet available

VIRTUAL SAMPLE ROOM WEB SITE OF GREEN BUILDING MATERIALS.

The objective is to develop a web site which will serve as an on-line catalogue/sample room of building materials provide low environmental impacts. It will serve anyone who is involved in the selection of the various building materials that go into residential buildings such as architects, builders, renovators, property managers, and homeowners. The intent of the site is to make available the information and knowledge currently available on this topic. The site will contain pictures of the products, the evaluation matrix, and the manufacturers information. This is a multi-partnered project including Public Works and Government Services Canada, Department of National Defense, Natural Resources Canada, Rural Municipality of Waterloo, and Human Resources Development Canada.

CMHC Project Officer: Darrel Smith

CIDN: 1986 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

CONCRETE

ANTI-CARBONATION COATINGS FOR USE ON CANADIAN BUILDINGS.

Carbonation is a process that reduces the natural alkalinity of concrete. Cement hydrates in the concrete react with carbon dioxide, from the atmosphere, to produce calcium carbonates. Advanced carbonation can induce corrosion of the reinforcing steel in a reinforced concrete structure which can in turn lead to fracture formation in concrete and structural distress.

Coatings and sealers have been found to slow or prevent the progress of carbonation in European laboratory tests. This field study initiated testing of certain coatings/sealers to determine their effect on the rate of carbonation. The products to be tested were selected on the basis of technical data made available by the suppliers. The criteria for suitable products were carbon dioxide resistance, water vapour permeance, and water resistance.

Five years after the application of the anti-carbonation coatings, the depth of carbonation increased by about 5mm in the control areas that were not provided with any form of protection. The depth of carbonation in each coated area progressed by an average of about 3.5mm, with the exception of one coating which provided no apparent protection against carbonation.

The results indicate that none of the coatings evaluated in this study were able to totally arrest the progression of carbonation. Three out of the four tested coatings partially retarded the rate of carbonation. One of the coatings did not have any measurable effect on the carbonation rate. The most effective coating, a siloxane primer with a methacrylate topcoat, reduced the carbonation rate by approximately 50%.

Prepared by Halsall Associates Limited. Principal Consultant: Peter Halsall. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Manager: Cate Soroczan. Ottawa: CMHC, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NOTE : Aussi disponible en français sous le titre : *Revêtements anti-carbonatation appliqués aux bâtiments canadiens.*

DEVELOPMENT OF A NEW EDITION OF THE STANDARD FOR CONCRETE CONSTRUCTION FOR HOUSING AND SMALL BUILDINGS (CSA A438).

The purpose of this project is to carry out the development of a new edition of the standard for concrete construction for housing and small buildings (CSA A438).

CMHC Project Officer: Jim Robar

CIDN: 1259 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

DURABILITY AND REPAIR OF CONCRETE - A PUBLICATION FOR BUILDING OWNERS AND MANAGERS.

This publication will examine repair strategies and provide repair-cost data and analytical tools for building owners and managers. It will be based on material presented at CMHC's seminars on cost-effective concrete restoration.

CMHC Project Officer: Cate Soroczan

CIDN: 1512 0200001-5

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

ELECTRO-CHEMICAL COMPATIBILITY OF STRUCTURAL PATCHES AND CONCRETE MIXES.

CMHC is supporting NRC/IRC research which will test an experimental patching mix and compare the results with commercial patching materials. The studies will attempt to determine the mix's compatibility with typical base concrete and its durability. A report is expected to be available late in 1998.

CMHC Project Officer: Cate Soroczan

CIDN: 1366 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

INVESTIGATION AND REPAIR STRATEGIES FOR CONCRETE CONSTRUCTION AND CATALOGUE OF INNOVATIVE CONCRETE ASSESSMENT AND REPAIR TECHNOLOGIES.

The purpose of this project is to create a survey questionnaire on concrete assessment, repair and monitoring strategies and report on existing protocols regarding concrete problems in multi-unit residential buildings.

CMHC Project Officer: Cate Soroczan

CIDN: 1865 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PRODUCTION AND ASSESSMENT OF QUALITY CONCRETE SURFACES.

This initiative will identify materials, methods, and evaluative tests to reduce the permeability of a concrete surface to gas and liquid. The objective is to produce a quality concrete surface ("covercrete") which would provide longer-term durability for residential concrete applications than is currently available. The work will be jointly funded by CMHC and NRC/IRC. The draft report is currently in the review stage.

CMHC Project Officer: Cate Soroczan

CIDN: 1517 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

CONCRETE

STANDARDIZATION OF CONCRETE REPAIR PROTOCOLS.

This project will research current assessment, monitoring and repair strategies for concrete repair. Existing protocols commonly used in the field as well as existing protocol guidelines assembled by various agencies (eg. CSA) will be catalogued. This research will provide consultants, contractors and building owners with available protocols and concrete repair strategies.

CMHC Project Officer: Cate Soroczan

CIDN: 1890 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

CONTAMINATED LANDS

DEMONSTRATION OF SAFE HOUSING ON LIGHTLY CONTAMINATED LANDS.

CMHC research into contaminated lands shows that some types of soil contaminants could be rendered innocuous through building design and operation. One example is heavy metals deep within the soil. If these pollutants can be avoided through design, the cost of land remediation could be greatly reduced. The project will include contaminant monitoring and the investigation of the predictive capabilities of site specific risk assessments.

CMHC Project Officer: Don Fugler

CIDN: 1946 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

RISK ASSESSMENT PROCEDURES FOR HOUSING ON CONTAMINATED LANDS.

Two projects researched methods of performing risk assessments for houses on or near contaminated lands. The first project compared the risk assessment procedures currently in use by nine contractors and the risk assessments generated by the contractors when they are all presented with the same hypothetical case. The risk assessment was a screening level, as opposed to a detailed assessment. The variation in risk assessments from one firm to another was several orders of magnitude. The report reveals the causes of these significant variations. There is a main report and a shorter summary report available from CMHC.

The second project assembled housing factors that can be useful in calculating these risks and presents them in a manner that is easy for site assessors to use. Copies of this guide, Estimating the Concentrations of Soil Gas Pollutants in Housing, are also available from CMHC.

CMHC Project Officer: Don Fugler

CIDN: 1534 0200002

Division: Research Division

STATUS: Completed Report

CRIME PREVENTION

ROLE OF PUBLIC HOUSING INTERVENTIONS IN SAFETY IMPROVEMENT AND CRIME PREVENTION AT THE DISTRICT LEVEL IN MONTRÉAL

The objective of this contract is to produce a summary report of the research project for dissemination purposes.

CMHC Project Officer: Brenda Baxter

CIDN: 1411 0100002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

SAFE COMMUNITIES: INFORMATION PRODUCTS AND TRAINING MATERIALS.

In partnership with the RCMP, CMHC is developing materials to promote the principles of crime prevention through environmental design (CPTED). Priorities were identified at a stakeholder forum held in the spring of '97. Materials include case studies of success stories at the subdivision and community level, and the enhancement and adaptation of training materials for a variety of distinct audiences, including builders and developers. The advisory document is expected to be available in the fall of 1998.

CMHC Project Officer: Paula Archer

CIDN: 1938 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

DOORS AND WINDOWS

DESIGN OF DURABLE JOINTS BETWEEN THE WINDOWS AND THE ENVELOPE.

The objective of this project is to establish construction, parameter and calculation method concepts to improve the durability of joints between walls and windows.

CMHC Project Officer: Jacques Rousseau

CIDN: 1839 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient : Mario Petrone, Petrone Architecte
200-2545 Delorimier Street
Longueuil, Québec J4K 3P7

AVAILABILITY: Publication not yet available

DOORS AND WINDOWS

RETROFIT AND REMEDIAL WORK ON EXISTING SLIDING DOORS AND WINDOWS.

The proposed research project aims at the development of practical solutions to the problems associated with the typically reduced performance of existing sliding windows and doors in terms of weather tightness, due primarily to wearing of materials.

CMHC Project Officer: Oliver Drerup

CIDN: 1834 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Mr. Jozef Zorko, Associate Architect, Desnoyers Mercure Inc.
3601 University
Montreal, Quebec, H3A 2B3

AVAILABILITY: Publication not yet available

ENERGY CONSERVATION

BUILDING ENERGY ESTIMATION METHOD BASED ON FUZZY LOGIC AND NEURON NETWORKS.

The objective of this project is to establish a rapid building energy estimation method based on fuzzy logic and neuron networks.

CMHC Project Officer: Sandra Marshall

CIDN: 1841 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Stanislaw Kajl, Université du Québec,
INRS - Urbanisation in Montréal
3465 Durocher Street
Montreal, Quebec H2X 2C6

AVAILABILITY: Publication not yet available

CMHC EMPTIED HEAT, AIR AND MOISTURE TRANSPORT MODELLING PROGRAM.

To provide engineering services to upgrade the CMHC EMPTIED Program from a DOS to Windows environment and to compile the necessary weather data to allow the program to evaluate the performance of wall systems in major cities of the U.S.

CMHC Project Officer: Duncan Hill

CIDN: 1107 0300003

Division: Research Division

STATUS: Ongoing Project

ENERGY EFFICIENCY CASE STUDIES OF MULTI-UNIT RESIDENTIAL BUILDINGS.

CMHC is in the process of documenting the application of energy efficiency measures in multi-unit residential buildings to be used as case studies. A trial case study of a housing co-operative in Ottawa is underway, to not only assess the strengths and weaknesses of the energy efficiency measures implemented, but also to identify what information can be disseminated to others in the building industry. Upon completion of the first case study, CMHC will be soliciting the housing industry for additional energy efficiency case studies. A compendium of case studies will be made available from CMHC. The case studies will also support the Energy Efficiency Opportunities Manual for Multi-Unit Residential Buildings that CMHC is in the process of developing.

CMHC Project Officer: Duncan Hill

CIDN: 1899 0200002,
1899 0200003

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

ENERGY EFFICIENCY OPPORTUNITIES MANUAL FOR MULTI-UNIT RESIDENTIAL BUILDINGS.

CMHC, in partnership with the Ontario Ministry of Municipal Affairs and Housing, is in the process of developing a manual that details energy efficiency measures for existing multi-unit residential buildings. The document will be based on one originally developed by the Ontario Ministry of Housing in the early 1980's. The new manual will offer proven, current energy efficiency measures for the building envelope, mechanical, electrical, and domestic hot water heating systems. A project steering committee consisting of members of the housing, utilities and government agencies has been formed to provide comment on the manual as it is developed. Publication of the manual is expected in 1998. The manual will be modularized and provided in such a format that will be easily updated over time.

CMHC Project Officer: Duncan Hill

CIDN: 1887 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

ENERGY PERFORMANCE CONTRACTING IN MULTI-UNIT RESIDENTIAL BUILDINGS: FINAL REPORT.

Energy Performance Contracting, EPC, is a unique business arrangement under which an Energy Service Company, ESCO, provides a turnkey service to finance building renewal projects from utility and operating cost savings. The ESCO provides energy analysis, engineering, construction, financing, operator training and building maintenance services to design and implement energy efficiency projects in existing building facilities. In Canada, ESCOs have completed approximately \$1 billion of projects since the early 1980's. The majority of projects have been in the institutional markets where energy use is relatively high, building ownership is stable, and third party lenders enjoy low credit risk customers.

A federal government sponsored survey of the EPC industry for 1994 reveals that of the approximately \$200 million of projects initiated in that year, rental apartments and condominiums accounted for only 2.4% or \$4.8 million of project value. This substantiates the general observation that EPC has yet to be fully exploited in the multi-unit residential sector.

The purpose of this project is to validate the effectiveness of EPC in the multi-unit residential sector. Five areas have been addressed: case studies of actual projects; best practices for procurement through to project

ENERGY CONSERVATION

financing; the U.S. experience; a review of current legislation; and policy and program recommendations. Twenty case studies of the application of EPC or EPC related projects have been documented. They indicate a growing interest by certain ESCOs in this relatively untapped market, describe the scope of measures typically implemented, financial arrangements entered into and the magnitude of the cost savings that have been achieved. Best practices and guidelines have been developed for building owners and operators for procurement, selection of energy efficiency measures, training, documentation, project financing, maintenance and utility analyses and monitoring. Sample procurement and contractual documents have been provided.

Prepared by Alan W. Levy Consulting. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Wayne Webster. Ottawa: CMHC, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

FIELD INVESTIGATION OF ENERGY IMPACT OF CORRIDOR AIR VENTILATION SYSTEMS.

A research project has been initiated to study the seasonal impact of the operation of corridor air ventilation systems in multi-unit residential buildings on heating season energy consumption. Traditionally, it was assumed that corridor air systems should be shut down during periods of low occupancy and/or occupant activity in order to reduce energy consumption. However, it is also suspected that shutting off a natural gas-fired corridor air system in an electrically heated building, may actually increase energy consumption. Both of the aforementioned assumptions are based on the theory that corridor air systems are capable of effective and efficient air delivery - which is now known to be incorrect. The research will attempt to determine the influence that the operation of corridor air systems within 4 buildings has on energy consumption. The systems will be cycled on and off over a sufficient period to allow for an analysis of trends in resultant energy consumption. This study will help to characterize the costs of operating corridor air systems and will also serve to identify energy efficiency strategies.

CMHC Project Officer: Duncan Hill

CIDN: 1934 0200002

Division: Research Division

STATUS: Ongoing Project

* NEW *

AVAILABILITY: Publication not yet available

INTERNATIONAL ENERGY AGENCY (IEA) : ENERGY RELATED ENVIRONMENTAL IMPACT OF BUILDINGS.

This three-year project, scheduled to end in 1999, is an IEA activity in which 14 countries are collaborating in the development of life-cycle energy modeling. Information will be compiled and published on the methodology and life-cycle environmental impact data. Chapters will describe the theory and practice of the topic and will include examples of how methods may be applied to different building types; the terminology of life-cycle-analysis (LCA) as appropriate for buildings; a summary of the leading LCA methods and sources of expertise; and the potential for extending the influence of the task directly into academia. CMHC is acting as the Operating Agency for this project.

CMHC Project Officer: Peter Russell

CIDN: 1629 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

LABORATORY TESTING OF DENSE PACK CELLULOSE FOR ATTIC INSULATION.

Some insulators claim that dense packing of cellulose insulation into hard to reach cavities (e.g. flat roof attics) prevents air movement along with providing insulation. Hydro Québec is looking at the technique for upgrading attic insulation of flat roof housing, largely in Montreal. CMHC and the Société d'habitation du Québec (SHQ) are also contributing funds to this project. The laboratory work took place in a two-storey environmental chamber at Concordia University. A flat roof attic was constructed in the chamber, set-up for monitoring, insulated with the dense pack cellulose method, and cycled through a seasonal change. The laboratory work is complete and data analysis is in progress. The research team hopes to discover whether dense pack cellulose can:

- prevent moisture migration into attics,
- act as an air movement barrier, and
- retain its insulating properties when exposed to moist conditions.

CMHC Project Officer: Don Fugler

CIDN: 1377 02010001,
1377 08010001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

OPTIMIZE: A METHOD FOR ESTIMATING THE LIFECYCLE ENERGY AND ENVIRONMENTAL IMPACT OF A HOUSE.

This computer program estimates the lifecycle energy requirements of a house as well as determining associated emissions. The program has been revised from a spreadsheet to a database to improve the instructions and user interface, and the computational speed. Before release in August 1998, plans are to stretch the application of the program to include multiple, non part 9 building code residential buildings by using Optimize on the Conservation Co-op building in Ottawa. This exercise will also support the Green Building Challenge '98 and International Energy Agency (IEA) Annex 31 initiatives.

CMHC Project Officer: Peter Russell

CIDN: 0865 0201002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

ENERGY CONSERVATION

A PHYSICAL CONDITION AND IAQ CHECKLIST FOR NRCAN'S ENERGUIDE FOR HOUSES RATING SYSTEM.

Natural Resources Canada (NRCan) and a number of industry stakeholders are in the process of developing a Canadian home energy efficiency rating system. The rating will be based on a visual evaluation of the house condition, a blower door test and energy data collection which will be analyzed using a computerized tool to identify the energy utilization of a new and/or existing home. The house will then be plotted on an energy utilization scale as it compares with performance criteria and assigned a numerical rating. The overall goal of this system is to reduce CO2 emissions on the environment. This CMHC project involves the production of an evaluation "checklist" that will be used to assess the physical condition and indoor environment of a house. This checklist will be available in June 1998.

CMHC Project Officer: Terry Marshall/Terry Robinson

CIDN: 1922 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RE-INSULATING WITHOUT ANY CONDENSATION PROBLEMS - EFFECT OF ADDING INSULATION ON THE DISPERSAL OF EXFILTRATING AIR.

The objectives of this project are: 1. To test a method of characterizing air exfiltration, experimentally and analytically. 2. To determine the impact of two insulation strategies - from inside and from outside - on the dispersal of exfiltrating air through various types of joints.

CMHC Project Officer: Sandra Marshall

CIDN: 1853 200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Dominique Derome, Concordia University
1455 de Maisonneuve Blvd. West
Montreal, Quebec H3G 1M8

AVAILABILITY: Publication not yet available

RENTAL STOCK ENVELOPE SURVEY.

The STAR Database, used for modeling Canadian housing performance, requires data from a representative number of rental houses. This project will look at rental housing stock to see how it differs from owner-occupied stock and will examine how rental stock could be suitably sampled for inclusion in the STAR Database.

CMHC Project Officer: Don Fugler

CIDN: 1766 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SUPPORT FOR THE ENERNET STUDENT TRAINING NETWORK.

CMHC is contributing to a project by SIRICON using the Internet to educate students in 20 Québec high schools on the principles of building science and house energy auditing. The WEB site is now complete and schools are participating. SIRICON will report on the success of the venture in spring 1998.

CMHC Project Officer: Don Fugler

CIDN: 1822 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

UPDATING THE AIRTIGHTNESS TESTING STANDARD.

The airtightness testing standard, Canadian General Standards Board (CGSB) 149.10, was published in 1986 and requires updating and simplification. CMHC has engaged CGSB and a contractor to undertake this work in 1998.

CMHC Project Officer: Don Fugler

CIDN: 1971 0200001,
1971 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

UPGRADE OF STAR DATABASE.

The STAR database contains characteristics and performance data on approximately 1000 Canadian houses. It is used as the basis for statistical examinations of Canadian housing stock, largely for energy modeling. A contractor consulted with agencies or groups to determine their need for this data. Most groups contacted were provincially or regionally based and stated that they did not need a national database. As the prime users will be CMHC, Natural Resources Canada (NRCan), and their contractors, there is no need to simplify the database form for other users. About 200 houses are currently being added into STAR in the Residential Energy & Economic Simulator (REES) spreadsheet format. There were further additions from NRCan and about 35 Toronto houses from CMHC.

CMHC Project Officer: Don Fugler

CIDN: 1766 0300001

Division: Research Division

STATUS: Completed

AVAILABILITY: No report will be published

FIRES & FIRE PREVENTION

CLEANING UP YOUR HOUSE AFTER A FIRE.

This booklet, one of a series, will offer practical advice on what should be done to avoid health problems when moisture problems or calamities occur. After a fire there can be ongoing smoke and mold problems that can seriously affect the health of occupants. A point-form reference card, that is intended to be hung by the furnace, is also being written and will be available from fire departments.

CMHC Project Officer: Jim White

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

THE COSTS AND BENEFITS TO MUNICIPALITIES OF MANDATORY RESIDENTIAL FIRE SPRINKLERS.

This multi-year study is examining the financial impact on municipalities requiring all new housing to be sprinklered. A complementary study is assessing the change in risk. The work is being undertaken by Arencon Inc., Clayton Research, and the National Fire Laboratories/NRC and is funded by CMHC, the Ontario Ministry of Municipal Affairs & Housing and the Office of the Ontario Fire Marshall.

The study uses a case study approach to assess the changes in costs and benefits that could occur if municipalities were to adopt mandatory sprinkler requirements for all new residential construction. There are six case study sites: Barrie and Burlington, Ontario; Pitt Meadows, B.C; Edmonton, Alberta; Kawacatoose First Nation, Saskatchewan; and Gatineau, Québec. The data collection, interviews with municipal and fire officials, economic and risk analysis are completed. The results were presented for review at a stakeholder forum in December. Revisions have been made and the final draft is being circulated to stakeholders for a final review. The report is expected to be available in mid 1998.

CMHC Project Officer: Mark Holzman

CIDN: 1235 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

DEVELOPMENT OF A NATIONAL ABORIGINAL LEARN NOT TO BURN (ALNTB) CURRICULUM (K-2).

The purpose of this project is to develop a national Aboriginal Learn Not to Burn curriculum (K-2) to serve as a companion resource book to the regular Learn Not to Burn program.

CMHC Project Officer: Alain Croteau

CIDN: 1719 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

THE JULY 1996 DISASTER IN THE SAGUENAY: THE EXPERIENCE OF REDEFINING A HABITAT.

The objective of this project is to understand and analyze the adaptation and integration mechanisms set up by families in rebuilding their homes following a natural disaster.

CMHC Project Officer: Marcel Boily, Chicoutimi Branch Office

CIDN: 1833 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Danielle Maltais, Université du Québec à Chicoutimi
555 de l'Université Blvd.
Chicoutimi, Quebec G7H 2B1

AVAILABILITY: Publication not yet available

HEATING & VENTILATION

APPAREILS DE COMBUSTION DE BOIS ET QUALITÉ DE L'AIR INTÉRIEUR.

From an economic standpoint, wood heating represents an alternative for Canadians. A number of people, however, are concerned about the potential deterioration of the ambient air quality in homes equipped with wood-burning appliances. The authors conducted a survey in the Quebec area to verify the significance of contamination from formaldehyde (HCHO), nitrogen dioxide (NO₂), breathable particles (PM10s) and carbon monoxide (CO) in houses with wood-burning appliances. In addition, they examined respiratory illnesses and symptoms among residents of homes heated partially or totally with wood.

A total of 89 adults and children took part in the study, with 1 adult and 1 child per residence. Among the homes, 59 were equipped with wood-burning appliances, and 30 were heated exclusively with electricity. Samples of HCHO, NO₂, PM10s and CO were taken in 49 houses (41 with a wood-burning appliance, 8 with no source of combustion products) for periods of 12 (CO) or 24 hours. Temperature and humidity readings were also taken. The respiratory symptoms of the participants (adults and children) were documented using a daily diary of symptoms. Data was also collected on home characteristics that were likely to deteriorate air quality.

In general, the contaminant concentrations measured were low for both houses with or without wood-burning appliances. In fact, and only for PM10s, 3 homes equipped with a wood heating appliance had contaminant levels higher than those recommended by Health Canada or the Environmental Protection Agency (EPA) respectively for indoor and outdoor air. Of these 3 homes, 2 had reasons other than the presence of a wood stove to explain the documented values. Still, the results, but especially the documented literature, showed that wood-burning appliances were likely to generate CO or PM10s.

Among the home variables most associated with the proportions of participants or the number of days of respiratory symptoms felt by the children or adults, the presence of animals or mould and a low frequency of open windows were documented. Residents living in homes with wood-burning appliances that had sustained combustion spillage, declared more respiratory illnesses and symptoms than those residing in houses either with a wood heating appliance with no spillage or else with no source of combustion products. There was no significant difference between the occupants of the last two housing categories.

HEATING & VENTILATION

The residents of homes equipped with wood-burning appliances should, just as all those living in residences with heating appliances likely to generate combustion products (regardless of the combustible), equip themselves with CO detectors. As well, in houses with wood-burning appliances, the presence of combustion spillage appears to be associated with an increase in respiratory illnesses and symptoms. A properly working, well installed, carefully maintained and adequately used appliance probably constitutes the best guarantee not only against fire and safety hazards, but also against the deterioration of indoor air quality and, consequently, the respiratory health of the occupants.

Prepared by Benoît Lévesque ... et al. CMHC Project Manager: Don Fugler. Ottawa: Canada Mortgage and Housing Corporation, 1997. (External Research Program).

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

EVALUATION OF RESIDENTIAL, IN-DUCT AIR FILTERS.

There are many residential air filters that have appeared in the last several years, providing an abundance of choice for consumers. Unfortunately, consumers have little objective information on the relative performance of these filters. This project will test the performance of different filters, from disposable fiberglass to electrostatic precipitators, in houses. The contractors will also look at how air filtration affects the levels of particulates (dust) in housing, and at the production of ozone by electrostatic precipitators. Pilot testing on the first house has illustrated the difficulty of making indoor particulate measurements. Pilot house testing is complete and five filter types will be tested in each of five additional houses through the winter and spring of 1997-98. A sample of houses with existing electrostatic precipitators will also be sampled for indoor ozone concentrations in summer 1998.

CMHC Project Officer: Don Fugler

CIDN: 1620 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

FIELD SURVEY OF HEAT RECOVERY VENTILATION SYSTEMS.

This research assessed the ability of occupants to operate and maintain HRV systems and the effects of maintenance on system performance. It also evaluated the ventilation effectiveness of common HRV installation methods and several other innovative ventilation systems for new and retrofit installations. The project involved the inspection of 60 houses with heat recovery ventilation systems, a survey of the occupants to determine their understanding and usage of their ventilation systems, telephone surveys of a further 15 households and intensive performance testing of 20 conventional and four experimental ventilation systems.

The research concluded that common conventional approaches to HRV installation were capable of ventilating houses in an effective manner. The majority of the HRV systems inspected were used and the occupants believed that the use of the HRV system was beneficial. While most occupants understood the intent of the systems, few were fully aware of all of the considerations involved in the operation and maintenance of these relatively complex systems which was reflected in the condition of the HRV installations. The study found that considerable improvements are possible in installation practice, system performance, occupant understanding and interaction with their ventilation systems.

CMHC Project Officer: Duncan Hill

CIDN: 1376 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HVAC SYSTEMS OF MID AND HIGH-RISE RESIDENTIAL BUILDINGS.

An evaluation of the mechanical systems of 25 mid and high-rise residential buildings will be performed in order to determine the changes in design and installation practices required when the 1995 National Building and Energy Codes are adopted. Additionally, the performance of the mechanical ventilation systems will be assessed in 10 buildings in terms of design criteria, design procedures, system strategies and installed performance levels. This information will be used to produce advisory documents showing how to meet codes and improve system performance.

CMHC Project Officer: Duncan Hill

CIDN: 1424 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

IDENTIFYING AND REMOVING POLLUTANTS FROM HEAT RECOVERY VENTILATORS.

The objective of this project is to determine whether dedicated ventilation systems harbour unhealthy levels of dust, mould and/or fungi; whether existing duct cleaning methods are successful at lowering those levels; and to develop recommendations and guidelines for builders and homeowners for the maintenance of dedicated residential systems.

CMHC Project Officer: Don Fugler

CIDN: 1652 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Terry Watters
Rural Route #3, Comp 308
Wolfville, Nova Scotia, B0P 1X0

AVAILABILITY: Publication not yet available

HEATING AND VENTILATION

INSPECTION OF DOMESTIC HEATING OIL TANKS.

The research covers work required to develop a practical, efficient and economical method of ascertaining the condition of functioning residential above ground oil storage tanks.

CMHC Project Officer: Darrel Smith

CIDN: 1829 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: William G. Moody, Moody Engineering Consultants
71 Newcastle Street
Dartmouth, Nova Scotia, B2Y 3M8

AVAILABILITY: Publication not yet available

1995 FIELD SURVEY OF INDOOR AIR QUALITY, AIRTIGHTNESS AND ENERGY CONSUMPTION PATTERNS OF NEW HOUSES.

CMHC, in partnership with Natural Resources Canada (NRCan - CANMET), characterized the indoor air quality, airtightness and energy consumption patterns of new single detached houses in Canada. The project represents an ongoing program to track the evolution of the Canadian stock and identify housing research priorities. The completed report, entitled "Airtightness and Energy Efficiency of New Conventional and R-2000 Housing in Canada, 1997" is available through NRCan - CANMET.

CMHC Project Officer: Don Fugler

CIDN: 1829 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: CANMET Energy Technology Centre
Energy Technology Branch, Energy Sector
Dept. of Natural Resources Canada
580 Booth Street, 13th Floor
Ottawa, ON K1A 0E4

or

Intellectual Property and Technical Information Management
Library & Documentation Services Division,
CANMET
Dept. of Natural Resources Canada
555 Booth Street, 3rd Floor, Room 341
Ottawa, ON K1A 0G1

HEATING AND VENTILATION

PERFORMANCE QUANTIFICATION ON SINGLE WELL HEAT PUMP.

The objective of this project is to quantify the performance of an existing open loop ground source heat pump system which uses a single domestic water well for both its supply and discharge requirements, and to demonstrate that a single well can be used as both the supply and discharge source for open loop ground water heat pump systems.

CMHC Project Officer: Chris Ives

CIDN: 1267 0200001

Division: Research Division, Housing Technology Incentives Program

STATUS: Ongoing Project

Grant Recipient: Bob Vasily and Associates

RR #1

Seeley's Bay, Ontario, K0H 2N0

AVAILABILITY: Publication not yet available

RESIDENTIAL MECHANICAL VENTILATION MANUAL - FRENCH VERSION.

In partnership with Heating Refrigeration and Air Conditioning Institute (HRAI), CMHC is contributing towards the translation of the Residential Mechanical Ventilation manual which will be used to train designers and installers in the province of Québec. Once trained they will be certified by Hydro Québec to perform the ventilation work on houses being built under the "Nouveau Confort" program which is similar to the R2000 program. The manual will be completed by the fall of 1998.

CMHC Project Officer: Darrel Smith

CIDN: 1904 0200

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RESIDENTIAL MECHANICAL VENTILATION SEMINARS.

This is a partnership project between CMHC, HRAI and NRC. NRC will be responsible for the development of the material as well as the promotion and delivery of the seminars. HRAI will be the delivery agent. The objective is to develop and deliver a one day seminar on residential mechanical ventilation and the 1995 National Building Code requirements. It will cover the need for ventilation in relation to indoor air quality and the benefits that it will provide to the occupants. Common, affordable ventilation system options which satisfy the code requirements will be discussed in detail. Options will include systems that are coupled to ducted heating systems as well as those which are not. It will be targeted to builders and home inspectors. The seminar will be suitable for delivery in all provinces and territories which have adopted the 1995 NBC with delivery in major centres commencing June 1998.

CMHC Project Officer: Darrel Smith

CIDN: 1972 0200001

Division: Research Division

STATUS: Ongoing Project

* NEW *

HEATING AND VENTILATION

TEMPERATURE CONTROL IN HOUSES.

A small project that measured air and concrete temperatures in 31 houses without power for a minimum of two weeks. Average outside temperatures during the period were -5°C to -10°C. All house interiors remained above 0°C, typically between 4°-7°C. No report will be published. The information will be used to provide better advice to homeowners during extended power outages.

CMHC Project Officer: Don Fugler

CIDN: 2025 0200002

Division: Research Division

STATUS: Completed

AVAILABILITY: No report will be published

VENTILATION AND HEATING SYSTEMS FOR NORTHERN CLIMATES.

In partnership with CHBA -Yukon and Yukon Housing Corporation, this first of a four phase three year project, will research the various ventilation and heating system options appropriate and acceptable for Northern climates. Field testing and monitoring their performance will also be conducted. This information will benefit the northern construction industry and may also be useful for increasing export potential of Canadian made ventilation systems.

CMHC Project Officer: Darrel Smith

CIDN: 2038 0200001

Division: Research Division

STATUS: Ongoing Project

* NEW *

AVAILABILITY: Publication not yet available

WHEN YOU REOCCUPY YOUR HOUSE AFTER A PROLONGED WINTER POWER OUTAGE.

As part of the *About Your House* Consumer Fact Sheet series and in response to the recent ice storm in Eastern Ontario and Quebec, a fact sheet on what steps you need to take when you return to your home during a prolonged winter power outage has been prepared. Tips are provided on turning on the heat, water, electricity, and roofing issues for when you reoccupy your home.

About Your House Fact Sheet; CE 11. Ottawa: Canada Mortgage and Housing Corporation, 1998.

STATUS: Completed

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NOTE : Aussi disponible en français sous le titre : *À votre retour à la maison après une longue interruption de courant en hiver.*

WOOD HEAT SAFETY IN AN EMERGENCY.

As part of the *About Your House* Consumer Fact Sheet series and in response to the recent ice storm in Eastern Ontario and Quebec, a fact sheet on wood heat safety in an emergency situation has been prepared. General tips are provided on getting the best out of wet wood, safe operation of wood stoves and fireplaces, temporary wood stove installation hazards and decorative fireplaces.

About Your House Fact Sheet; CE 10. Ottawa: Canada Mortgage and Housing Corporation, 1998.

STATUS: Completed

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642, Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NOTE : Aussi disponible en français sous le titre : *Le chauffage au bois en toute sécurité lors d'une situation d'urgence.*

HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

ADVISORY DOCUMENT ON MECHANICAL AND ELECTRICAL SYSTEMS IN MULTI-UNIT RESIDENTIAL BUILDINGS.

The technical report on the design of energy conserving equipment and systems providing plumbing, heating, ventilation and air conditioning, lighting and power in multiple-unit buildings has been reviewed by practitioners. The system design and installation practices noted in the report are being modified to reflect their comments. An advisory document to recommend "good engineering practice" for designers, owners and consultants should be available in late 1998.

CMHC Project Officer: Duncan Hill

CIDN: 1774 0300004, 5, 7

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BC MOISTURE PROBLEMS - COMPUTER SIMULATIONS.

This research will study the drying potential of various wall configurations and is intended to provide data to bolster recommendations to be incorporated in the Localized Best Practice Guide. The information will be prepared as a guide for construction practices in the Lower Mainland of British Columbia. As the cost of doing all the tests proposed may be prohibitive, it was recommended that computer simulation WALLDRY be used to determine which walls might be more promising to test than others, potentially leading to a reduction in the cost of the test program.

CMHC Project Officer: Jacques Rousseau

CIDN: 1816 0300004

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

BC MOISTURE PROBLEMS - ENVELOPE DRYING RATES EXPERIMENT.

Findings from the 'Survey of Building Envelope Failures in the Coastal Climate of British Columbia' revealed that the construction of walls with face seal or concealed barrier systems does not promote rapid drying of wall assemblies once the moisture has saturated the moisture barrier and passed into the sheathing. The solution to promote drying of the wall assembly has been to introduce an air cavity behind the claddings. The objective of this project is to identify, through laboratory work, a range of cavity and vent configurations which will provide wall drying capability characteristics necessary to deal with the coastal British Columbia climate.

CMHC Project Officer: Jacques Rousseau

CIDN: 1816

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

BC MOISTURE PROBLEMS - HYGROTHERMAL PERFORMANCE OF STUCCO.

The project objectives are to develop fundamental and applied understanding of the hygrothermal performance of stucco based wall systems for Vancouver, B.C. weather conditions. The properties will be investigated through laboratory evaluation. The long term hygrothermal behaviour of the building envelope components will be simulated using the LATENITE computer program. The result of the work will guide the "Envelope Drying Rate Analysis" study. The work is being collaboratively funded with the NRC/Institute for Research in Construction and is part of the recently launched Consortium on Moisture Control Strategies of Wall Systems.

CMHC Project Officer: Jacques Rousseau

CIDN: 1816 0300007

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

BC MOISTURE PROBLEMS - LOCALIZED BEST PRACTICE GUIDES.

This project will produce supplements to the "Best Practice Guide for Wood Frame Building Envelopes" and the "Best Practice Guide for Flashings" specific to British Columbia coastal climate construction. The new document must deal with the conclusions, recommendations and the seventeen problem details identified in the "Survey of Building Envelope Failures in the Coastal Climate of British Columbia", November 1996 by Morrison Hershfield, for CMHC. This project has been undertaken in collaboration with the Building Envelope Research Consortium and the Canadian Wood Council. The reports will be published as national documents available through CMHC.

CMHC Project Officer: Jacques Rousseau

CIDN: 1816 0300003

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

B.C. MOISTURE PROBLEMS - QUALITY ASSURANCE PROTOCOL.

The objective of this study is to produce a locally relevant protocol which will form the baseline quality management system for the exterior envelope of 3 and 4 storey wood frame construction in British Columbia. The protocol deals with the conclusion and recommendations identified in the 'Survey of Building Envelope Failure in the Coastal Climate of British Columbia'. The protocol will also tie into the "Best Practice Guide for Wood Frame Construction in the Coastal Climate of British Columbia" which is currently under development.

CMHC Project Officer: Jacques Rousseau

CIDN: 1816 0300006

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

BC MOISTURE PROBLEMS - SMALL SCALE TESTING AND DEVELOPMENT PROTOCOL.

This work results from the conclusions and recommendations of the "Survey of Building Failures in the Coastal Climate of British Columbia". The intent of this initial testing project is to give the industry some sense of what will or will not work and examine the sensitivity of the various systems to specific variables. The testing will provide a relative comparison under a specific set of environmental conditions. Although the work will not provide a definitive solution, it will serve to provide guidance regarding the use of some proposed new assemblies. The work will also develop protocol for the "Envelope Drying Rate Analysis" which is currently planned. The work is being funded in collaboration with the NRC/Institute for Research in Construction, the City of Vancouver, Van Maren Limited, Centreville Limited and Aquastap Limited.

CMHC Project Officer: Jacques Rousseau

CIDN: 1816 0300005

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

BEST PRACTICE GUIDE: BUILDING ENVELOPE DESIGN FOR BRICK VENEER/STEEL STUD WALL ASSEMBLIES.

The objective of this project is to prepare a "best practice" guide for steel stud exterior wall construction. The document will contain details, specifications, sequence of construction and inspection/commissioning information. The document will be available in paper copy and on CD Rom. A series of seminars will present the information and issues raised in the guide.

CMHC Project Officer: Sandra Marshall, Research Division

CIDN: 1930 0200001

AVAILABILITY: Publication not yet available

STATUS: Ongoing Project

BEST PRACTICE GUIDE: BUILDING ENVELOPE DESIGN FOR WOOD FRAME WALL ASSEMBLIES.

The objective of this project is to prepare a "best practice" guide for various exterior wall assemblies with wood frame construction. The document will contain construction details, specifications, sequence of construction and inspection/commissioning information. The document will be available in paper copy and on CD ROM.

CMHC Project Officer: Sandra Marshall, Research Division

CIDN: 1930 0200001

AVAILABILITY: Publication not yet available

STATUS: Ongoing Project

BEST PRACTICE GUIDE - FIRE AND SOUND ASSEMBLIES FOR MULTI-FAMILY BUILDINGS.

This document, targeted at designers of multi-family buildings, will provide the latest information on CMHC research into fire and sound partitions, floors, flanking, plumbing noise, etc. The document is being produced in collaboration with the NRC/IRC.

CMHC Project Officer: Ken Ruest

CIDN: 1804 0300003

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

BRICK VENEER CONCRETE MASONRY UNIT BACKING. BEST PRACTICE GUIDE: BUILDING TECHNOLOGY.

One of the major contributors to envelope defects has been a failure to apply existing knowledge of envelope construction in the form of details that builders can use during construction. The Best Practice Guide series is intended to encourage state-of-the-art construction by providing detailed description and CAD details of building features that can be adapted and developed by professionals to suit the particular conditions of their buildings.

Chapters 1 and 2 of this guide describe the various components and materials used in brick veneer/concrete masonry unit backing. They also provide references to relevant industry standards.

Chapter 3 outlines the building science concepts that underpin the CAD details in the rest of the guide.

CAD details in Chapter 4 illustrate such features as window sills, parapets, curtain walls and patio doors. Explanatory notes outline how each feature works, and checklists are provided for designers and builders. An accompanying diskette contains AutoCAD files of the details in chapter 4.

Chapter 5 supplements the earlier descriptions with specifications for masonry wall design and construction. Chapters 6 to 8 deal with construction sequencing, inspection, quality control and commissioning the building envelope. Chapter 9 offers guidance on maintenance and repair.

A reference section lists other useful publications on masonry construction, design and research. The appendix is a guide to the use of the diskettes.

Prepared by Ashok Malhotra and Herb Otto. Ottawa: Canada Mortgage and Housing Corporation, 1997.

Order number: 6917E. **** Price:** \$89.00 + GST and handling charges.

Binder format + 24 Easy to use CAD drawings on CD-ROM.

The CD-ROM CAD drawings are PC format and convertible to MAC format (instructions provided in the guide). This product is sold as a package. The CD-ROM is not available separately.

STATUS: Completed Report

AVAILABILITY: CMHC Information Products

700 Montreal Road

Suite 1000

Ottawa, Ontario

K1A 0P7

Tel: 1-800-668-2642 or 1-800-668-2642

Fax orders from Canada: 1-800-245-9274

International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre : *Fonds en blocs de béton et placage de brique (6918F).*

BUILDING ADAPTABILITY: A SURVEY OF SYSTEMS AND COMPONENTS.

This report looks at current theory and technology from exhaustive international sources addressing the adaptability of buildings. In light of this, actual Canadian case studies are considered and some guidelines are formulated for designers facing the opportunities and problems associated with adaptability. The outcome of the research is seen as an information tool for designers and builders. The work is primarily concerned with medium-rise to high-rise construction, and the scope of research is focused on but not restricted to residential programmes.

The study reviewed historical, social and design perspectives on why and how buildings change and identified the two fundamental and complementary approaches to adaptability: one based on design and another based on technology. These approaches were then tested through the examples of ten building conversions. This process yielded nine principles that could be followed during the design process of a building. In implementing these principles, a number of options in systems and components become possible and these are explained in a set of guidelines that relate specifically to elements of the building envelope, structure and environmental systems.

The study asserts that awareness of the potential for adaptability could in itself be a significant factor in designing adaptable buildings; when enhanced with the knowledge of principles and practical guidelines it could be a decisive factor in increasing a building's future potential and its environmental benignness.

Prepared by Young & Wright Architects Inc., in association with Engineering Interface Limited and Yolles Building Science Services Limited. Ottawa: Canada Mortgage and Housing Corporation: CANMET, Natural Resources Canada, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

CASE STUDIES FOR INNOVATIVE TECHNOLOGY AND SOLUTIONS IN SUCCESSFUL MULTI-FAMILY HOUSING.

Successful innovative Canadian multi-family residential buildings are being identified and documented for future monitoring. Areas such as durable building envelope, energy savings, life-cycle costs and environmentally responsive solutions will be evaluated. One multi-family residential building, the Conservation Co-operative, was selected for evaluation to be presented at the Green Building Challenge in Vancouver in the fall of 1998.

CMHC Project Officer: Sandra Marshall

CIDN: 1817 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

CASE STUDY OF THE RENOVATION OF AN APARTMENT BUILDING WITH SOLID MASONRY WALLS.

A 90 year old commercial building with solid masonry walls has been gutted and renovated into a residential building for low income single persons. The renovation involved the addition of thermal insulation to the building envelope, the application of stucco to the exterior of three of the four sides of the building, restoration to the front masonry facade, installation of a balanced mechanical ventilation system and a combination hydronic baseboard/radiant floor heating system. The building envelope is being monitored to provide an indication of its potential long-term performance. Energy and water use and indoor air quality will also be monitored in the renovated building to assess the strengths and weaknesses of the renovation strategy. A case study will be produced to document the work undertaken and the results of the performance monitoring.

CMHC Project Officer: Duncan Hill

CIDN: 1730 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

COMPARTMENTALIZATION OF EXISTING HIGH-RISE APARTMENT BUILDINGS.

The purpose of the project is to determine the practicality of compartmentalizing existing apartment buildings and determining the effectiveness of compartmentalization on controlling unwanted air change, energy costs and comfort problems.

CMHC Project Officer: Duncan Hill

CIDN: 1655 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Mark Lawton Building, Science Specialists and
Morrison Hershfield Limited
2440 Don Reid Drive
Ottawa, Ontario, K1H 8P5

AVAILABILITY: Publication not yet available

ENVIRONMENTAL IMPACT ASSESSMENT TOOLS FOR MULTI-UNIT HOUSING.

This project will assess 6 different environmental assessment tools to determine their applicability to multi unit residential buildings. The best features and limitations of each tool will be identified and transmitted to the authors of each tool. Four innovative buildings will then be assessed by one of the tools. This work will be presented to the GBC '98 committee as part of CMHC's contribution to the development of the residential component of the GBC core evaluation criteria.

CMHC Project Officer: Cate Soroczan

CIDN: 1872 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

ESTABLISHING THE FEASIBILITY AND FRAMEWORK FOR A MULTI-FAMILY HOUSING DATABASE.

CMHC is in the process of determining the feasibility of establishing a nationally representative multi-family housing database. Anticipated uses for such a database include, studies of the impact of energy retrofits on the energy consumed and pollutants emitted by multi-family housing. With an appropriate level of data, repair and replacement trends impacting on condition and resource requirements for this form of housing, could be identified. The project will identify the uses of such a database, subsequent data requirements, the quantity, quality and availability of data and a database format and management system. Based upon the findings of this project, CMHC will make a decision whether or not to pursue the development of a multi-family housing database.

CMHC Project Officer: Duncan Hill

CIDN: 1805 0800001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

EXPORTING CMHC'S TECHNICAL SEMINAR SERIES.

Over the past fifteen years, CMHC has undertaken research work into the development of technologies for highrise buildings. The work could be marketable in the US and other countries where they are being faced with similar concerns regarding energy efficiency, airtightness, noise control and rain penetration control of the building envelope. CMHC's research activities into the building sciences were undertaken by Canadian consulting firms who have gained considerable knowledge that could also be marketed in other countries. A pilot series of seminars will be conducted in the USA in partnership with the Energy Efficient Building Association.

CMHC Project Officer: Ken Ruest

CIDN: 1928 0200

Division: Research Division

STATUS: Planned

AVAILABILITY: Publication not yet available

*** NEW ***

FIELD INVESTIGATIONS OF INDOOR ENVIRONMENT AND ENERGY USAGE IN MID-RISE RESIDENTIAL BUILDINGS.

The focus of this study was to evaluate the thermal and indoor environment performance of mid-rise buildings, more specifically three to five storey apartments. The research plan included the development of test and evaluation protocols for indoor environment parameters, energy consumption patterns and ventilation system performance parameters for mid-rise buildings. As part of the field work, a total of eight buildings were chosen for detailed evaluation: four buildings in Vancouver, two in Ottawa and two in Toronto. All the buildings were built in the last five years (1990 or later) to reflect current design and construction practices.

Mid-rise residential buildings had the necessary ventilation and exhaust equipment installed to meet the code requirements. However, the performance evaluation showed that these exhaust and ventilation systems did not function to the required level and generated significantly low air movement in the building. Make-up air systems provided the fresh air in corridors which eventually dumped to the outside due to a lack of proper transfer mechanism between the corridor and the suites. The under-performance of ventilation systems also seem to cause high levels of relative humidity, high levels of carbon dioxide, window condensation and mold growth in several buildings. In several buildings, relative humidity and carbon dioxide levels exceeded the normal acceptable limits set by Health Canada Guidelines. These buildings also had insufficient ventilation and air movement in the suites. Occupant complaints are also high. The occupant complaints in these buildings seem to be due to improper and/or lack of adequate ventilation and air distribution.

Comparison showed that the mean value of the energy consumption for a high-rise and mid-rise building is almost the same. Compared to a single family house, the mid-rise residential units had about 10% less energy consumption per unit area despite the fact that mid-rise units had significantly less exposed surface area than single-family houses. Overall, the field survey and energy analyses provided significant new insights into the mid-rise apartment buildings. These findings should help in future design, construction and commissioning of apartment buildings.

Prepared by Scanada Consultants Limited. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Manager: Duncan Hill. Ottawa: CMHC, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

FIRE RESISTANCE AND SOUND TRANSMISSION OF FLOOR ASSEMBLIES.

This project, currently in 'draft' stage, measured and developed a database of fire and sound ratings on selected floor assemblies and is a continuation of a recently completed joint NRC/IRC and CMHC project which established the sound and fire resistance ratings of 160 wall assemblies.

CMHC Project Officer: Ken Ruest

CIDN: 1697 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

FLANKING NOISE II (SOUND AND FIRE PERFORMANCE OF FIRESTOPS IN MULTI-FAMILY DWELLINGS).

This project, undertaken in collaboration with NRC/IRC, looked at remedial measures for existing construction and the redesign of fire stops, which are a major source of flanking noise transmission in multi-unit construction. The project is complete and the final report is available through CMHC.

CMHC Project Officer: Ken Ruest

CIDN: 1316 0301001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

GOVERNOR'S ROAD AND SPENCER CREEK VILLAGE PROJECT, DUNDAS, ONTARIO.

The purpose of this project was to carry out the CMHC Healthy Housing and IDEAS Challenge objectives on the Governor's Road and Spencer Creek Village project in Dundas, Ontario.

CMHC Project Officer: Sandra Marshall

CIDN: 0840 0309007

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

GUIDELINES FOR THE RETROFIT OF UNINSULATED MASONRY WALLS.

In cooperation with NRC's Institute for Research in Construction, a project has been initiated to assess common forms of solid masonry walls in commercial and residential buildings and current energy retrofit strategies. Investigations of previously retrofitted walls are being performed to determine the impact on the durability of the building envelope.

CMHC Project Officer: Duncan Hill

CIDN: 1730 0300003

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

IDEAS HIGH-RISE CHALLENGE.

The IDEAS Challenge is intended to demonstrate the benefits of innovative design and technology in the operation of high-rise residential buildings. The Challenge focuses on five aspects of building design: envelope durability, energy efficiency, indoor air quality, environmental conservation and accessibility. One project in Montreal is built and monitoring is being carried out. Acoustic details have been tested. Two booklets are available, one that describes the IDEAS Challenge and the features of the five finalist projects and another which is a "Better Building" guide to innovation in the design and construction of high-rise residential buildings. The design process of a building in Dundas, Ontario which is exploring the adaptation of the IDEAS Challenge goals and details of CMHC's Best Practice Guide, is being documented.

CMHC Project Officer: Sandra Marshall

CIDN: 0840 0300

Division: Research Division

STATUS: Ongoing Project

HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

INVESTIGATION OF SMOKE CONTROL IN HIGH-RISES BY POSITIVE PRESSURE VENTILATION.

A research project is being developed to study the use of positive pressure ventilation (PPV) systems to contain and expel smoke from high-rise buildings during a fire emergency. PPV systems have been used in the U.S. in low-rise buildings. The system consists of a portable, high velocity fan which is used by the fire department to clear smoke from buildings in order to facilitate access to the fire and to aid in occupant evacuation. Preliminary studies have been conducted in multi-unit residential buildings but not in cold climates where stack effect may continue to dominate smoke movement. The research program is the result of a joint venture between CMHC, the City of Ottawa Fire Department and the Fire Laboratory of the Institute for Research in Construction of NRC. The ability of PPV to contain and clear smoke from exitways in high-rise buildings will be evaluated at the Fire Laboratory's full scale test building under both summer and winter conditions. If successful, PPV may offer Fire Departments an effective, low cost life and property saving tool.

CMHC Project Officer: Duncan Hill

CIDN: 1983 0200002

Division: Research Division

STATUS: Planned

AVAILABILITY: Publication not yet available

*** NEW ***

MONITORING INNOVATIVE MECHANICAL AND ELECTRICAL SYSTEMS.

The innovative mechanical and electrical energy consuming and producing systems in high-rise housing at a recently completed housing project in Peel, west of Toronto, are being monitored. A gas-fired cogeneration system was installed that provides electricity and thermal heat to the building. The building's owners are concerned that the system is not performing in an economically viable manner. An extensive monitoring and performance assessment is underway to evaluate system performance. The cost of energy provided to the building by the cogeneration system in terms of fuel consumption, maintenance expenditures, avoided utility invoicing and other considerations will be assessed. The performance and cost of the cogeneration system will be compared to other alternative but more conventional options.

CMHC Project Officer: Duncan Hill

CIDN: 1260 0800001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

MONITORING THE RETROFIT OF A RESIDENTIAL HIGH-RISE BUILDING ENVELOPE.

A case study of a 20 year old high-rise building in Toronto has been undertaken to document and monitor the performance of the retrofitted walls. In November 1997, an Exterior Insulating Finish System (EIFS) was installed over the precast block walls as part of an overall building renewal project. Instrumentation to monitor heat, air and moisture regimes within the wall sections was installed which is currently being monitored for one year to assess the performance of the retrofit strategy. Preliminary results indicate that the walls are performing in a satisfactory manner but an assessment of the full year's monitoring will be necessary.

CMHC Project Officer: Duncan Hill

CIDN: 1602 0800001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

OPERATING AND MAINTENANCE BOOKS FOR MECHANICAL AND ELECTRICAL SYSTEMS IN MULTI-UNIT BUILDINGS.

Two publications, currently in 'draft' stage, on improving the operating performance of modern residential building systems have been developed. The first document, for owners and managers, links good operating practices with desirable investment strategies. The second, for building operating and maintenance staff, updates information on mechanical and electrical systems and incorporates preventative maintenance checklists for multi-unit residential buildings.

CMHC Project Officer: Jacques Rousseau

CIDN: 1774 0300004

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PERFORMANCE MONITORING: BRICK VENEER/STEEL STUD (BV/SS) WALL SYSTEM: PHASE 4.

Phase 4 of this study involves a fourth year (1997/98) of in-situ performance monitoring of a BV/SS wall system, with respect to air and moisture movements after the top vents in the brick veneer wall have been opened. The performance of a wall is being monitored using temperature, moisture and air pressure sensors connected to an automatic data logging system. Preliminary results indicate that the vent holes did not contribute to drying the wall but increased the moisture loading of the brick veneer. Even though the BV/SS wall system is typical of current practices and workmanship was satisfactory, the results of the study demonstrate that performance problems exist that may lead to significant distress over the long term. The more serious performance problems identified in this study are due to design weakness demonstrating the need to improve design and construction standards. Phase 1 & 2 reports are available from CMHC. The results of the Phase 3 research demonstrated no significant difference from Phase 1 and 2 and the Phase 4 draft report has been received.

CMHC Project Officer: Jacques Rousseau

CIDN: 0787 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PROTECTING GYPSUM SHEATHING IN INSULATED STEEL-STUD WALLS.

The purpose of this project is to prepare and test wall systems that include combinations of three different warm face treatments and six different cold side materials. The warm face of the wall systems will be treated in one of the following ways: no protection; a vapour permeable but water repellent membrane such as Tyvek or Typar; a vapour barrier such as polyethylene.

CMHC Project Officer: Jacques Rousseau

CIDN: 1282 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Kim Pressnail, University of Toronto
35 St. George Street
Toronto, Ontario, M5S 1A4

AVAILABILITY: Publication not yet available

RAIN CONTROL BEST PRACTICE GUIDE.

This document, currently in the 'draft' stage, provides the latest information on controlling the penetration of rain into walls. It is based on CMHC's research and other information regarding rain penetration control. The work is being funded in collaboration with the American Architectural Manufacturers Association.

CMHC Project Officer: Jacques Rousseau

CIDN: 1258 0300004

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RAINSCREEN 2.1 COMPUTER PROGRAM

The RAINSCREEN program was developed to assist in the design of rainscreen pressure equalized wall assemblies. This project is aimed at producing a new version of the RAINSCREEN computer program, including a tutorial program and a manual that will be much more user-friendly. The work involves adapting the existing program to Windows and Mac environments and validating the program to laboratory test results to increase user confidence in the program. The BETA IBM version of Rainscreen 2.1 (English only) is available through e-mail (jroussea@cmhc-schl.gc.ca). The program is being updated to offer a better interface to determine the effects of the air barrier and cladding flexibility.

CMHC Project Officer: Jacques Rousseau

CIDN: 1258 0300005

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

REPAIR AND RETROFIT CASE STUDIES FOR MULTI-UNIT RESIDENTIAL BUILDINGS

CMHC is documenting repair and retrofit activities in multi-unit residential buildings. The first 30 case studies will document building characteristics, the type of problems that prompted the repairs and retrofits, costs, benefits, etc. A wide range of case studies will be included to reflect regional repair and retrofit priorities. The studies will be useful for other members of the multi-unit residential building industry to refer to when considering similar projects. An information template that can be used as a guideline for the type of information that should be extracted from a repair or retrofit project in a multi-unit residential building has been developed. CMHC is currently soliciting the building industry for case studies and will retain consultants to provide the necessary documentation. A compendium of case studies will be assembled and made available to the members of the housing industry.

CMHC Project Officer: Duncan Hill

CIDN: 1782 0300001-7

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

TECHNICAL AUDIT OF APARTMENT BUILDINGS IN TORONTO

A representative sample of 63 multifamily rental buildings in Toronto have been audited in order to determine their condition. The buildings were examined to determine their durability, and health and fire safety aspects, and the related repair costs. The project is a joint initiative with the City of Toronto. Preliminary results show the repair costs to be approximately \$580/unit/year, for ten years, not including regular maintenance or finishings.

CMHC Project Officer: Sandra Marshall

CIDN: 1537 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

WIND-DRIVEN RAIN FOR THE GOVERNOR'S ROAD PROJECT.

The objective of this project is to carry out the impact study of Wind-Driven Rain for the Governor's Road project and the effect of variations of the parapet/cornice at the top of the building.

CMHC Project Officer: Sandra Marshall

CIDN: 1123 0300013

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOME AUTOMATION

HOME AUTOMATION - VOICE COMMUNICATION SOFTWARE.

The objective of this project is to review current and proposed voice recognition software with potential for home automation applications and test the speech capabilities, and compare them with what is proposed for development in this project.

CMHC Project Officer: Tom Parker

CIDN: 1397 0200001

Division: Research Division, Housing Technology Incentives Program

STATUS: Ongoing Project

Grant recipient: Dairnac Developments
835 Carlaw Avenue
Toronto, Ontario, M4K 3L8

AVAILABILITY: Publication not yet available

HOME OWNERSHIP

A CANADIAN HOMEOWNER'S MANUAL.

This project will respond to the information needs of the housing consumer and develop an owner's manual that is comprehensive and specific to each house. The manual will be of interest to homebuilders as a marketing and service tool and for reducing callbacks; and to the warranty programs as a means of conveying good house maintenance and operation practices to the home owner. A national advisory committee was created to oversee the evolution of the manual and to ensure that the views and experience of builders and warranty programs are considered. Focus group testing was conducted first on the idea of the manual and subsequently on the completed draft version. Consumers were enthusiastic about the idea and praised the product. The draft text of the manual is ready and it will now be edited for publication which is scheduled for June 1998.

CMHC Project Officer: Fanis Grammenos

CIDN: 1559 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSE CONSTRUCTION

APPLICATION OF STRUCTURAL STEEL TO SINGLE-FAMILY RESIDENTIAL CONSTRUCTION.

The objective of this project is to investigate the use of structural steel in single-family residential construction, and analyze its applicability to Canada, taking into account technical requirements, cost-effectiveness and sustainability.

CMHC Project Officer: Rob Duncan

CIDN: 1831 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Michel De Spot, Director, Node Engineering
2703 124B Street
Surrey, British Columbia, V4A 3N8

AVAILABILITY: Publication not yet available

BUILDERS' SERIES PUBLICATIONS.

The "Builders Series" publications will be available in June 1998 as a one, all inclusive, book that details construction defects, problems, causes and solutions. The new title will be "Building Solutions: A Problem Solving Guide for Builders and Renovators". The chapters of this document will reflect the information from the former modules and include, "Foundations"; "Floor Systems"; "Wall Systems"; "Roof and Ceiling Systems"; "Indoor Air Quality and Ventilation"; and "Noise Control" and also include recent research results.

CMHC Project Officer: Darrel Smith

CIDN: 1993 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CMHC EARTHQUAKE RESISTANCE: GUIDE FOR UPGRADING EXISTING WOOD FRAME HOUSES.

This publication is targeted at the builder/renovator and D-I-Yer audiences and provides information on improving the earthquake resistance of new and existing homes. The document contains information on understanding earthquakes and how houses react to them, evaluating the house, property and contents and contains decision making processes for upgrading houses. There will also be a brochure titled, "How Would Your Home Stand Up?" which will provide information and a checklist for consumers. The advisory document will be available in June 1998.

CMHC Project Officer: Darrel Smith/Mark Salerno

CIDN: 1355 0301001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CSA Z-824 STANDARD.

The objective of this project is to take the existing draft of the CSA Z-824 Log Standard, rationalize the organization of the standard contents, and produce a draft for comment.

CMHC Project Officer: Rob Duncan

CIDN: 1811 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

DEVELOPMENT OF COMMERCIALLY VIABLE CONCEPTS AND A DESIGN FOR A RESIDENTIAL FRAMING SYSTEM FOR A MONOCOQUE HOUSE.

The purpose of this project is to undertake the development of commercially viable concepts and a design for a residential framing system for a monocoque house, to provide on-site guidance during the construction of prototypes of the design and to undertake post construction performance monitoring of the structures.

CMHC Project Officer: Rob Duncan

CIDN: 0657 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSE CONSTRUCTION

EASY-ACCESS THRESHOLDS TO BALCONIES: PROBLEMS AND POSSIBLE SOLUTIONS

The objective of this project is to provide architects, builders, developers and regulatory agencies with a tool demonstrating the possibilities of producing easy-access thresholds to balconies in new or renovated residential buildings.

CMHC Project Officer: Sandra Marshall

CIDN: 1995 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Pierre Richard
4800 Marquette Street
Montreal, Quebec, H2J 3Y7

*** NEW ***

AVAILABILITY: Publication not yet available

ISSUES PAPER ON LIABILITY IN HOUSE CONSTRUCTION.

The Canadian Home Builders Association (CHBA) has expressed a concern that, in housing construction, it is becoming less clear who is liable for specific aspects relating to the house. They also are concerned that, as a result of cutbacks, municipalities are not carrying out inspections to the extent they once did and may be losing the capacity to properly enforce building regulation. This joint project, co-funded by CMHC and CHBA and managed by CHBA, will produce a paper discussing the issue of liability in housing construction across Canada and identify who is and is not liable. It will serve as the basis for discussion on these issues and for further study. The National Research Council (NRC) will also be a participating partner as the agency responsible for code development. An initial draft has been prepared and the project has been extended to include provincial consultations at CHBA's request.

CMHC Project Officer: Mark Holzman

CIDN: 1920 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

LABOUR SHORTAGES IN RESIDENTIAL CONSTRUCTION.

The purpose of this project is to examine the available evidence concerning the extent of labour shortages in the residential construction industry; and document the overall labour supply situation in the residential construction industry.

CMHC Project Officer: Jamie Angus

CIDN: 1860 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RE-USE: INTEGRATION OF USED BUILDING MATERIALS INTO NEW CONSTRUCTION.

The objective of this project is to promote the practice of re-use of building materials as a viable approach in the 3Rs of sound environmental practice for the construction industry, presently including waste management through recycling and reduction. Research will address 4 main concerns: economic, environmental, legislative/practical and perceptual -- presently barriers to viability in practice.

CMHC Project Officer: Darrel Smith

CIDN: 1842 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Mark Poddubiuk, Pearl Poddubiuk Architects
995 Girouard
Montreal, Quebec, H4A 3B9

AVAILABILITY: Publication not yet available

STUDY OF SEAM TELEGRAPHING IN RESIDENTIAL FLOORING.

A CHBA led research project was conducted, in partnership with Macmillan Bloedel, the Canadian Plywood Association, the Canadian Particleboard Association, the Industrial Research Assistance Program of N.R.C. and CMHC. This research identified that the seam telegraphing problems in residential flooring currently being experienced by the housing industry are predominantly attributable to site conditions which lead to complex interactions between layers of materials. Of greater significance than that of material type, are the installation practices followed. Moisture problems, for a number of different reasons from material acclimation to construction material generated moisture (ie: floor slabs), are the main reason for this problem. A full report will be available from the CMHC Canadian Housing Information Centre and through other stakeholders in June 1998.

CMHC Project Officer: Darrel Smith

CIDN: 1729 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

"TALL WALL" CONSTRUCTION DETAILS.

The purpose of this project is to develop a series of cost-effective, common design and construction details, certified by a structural engineer registered in the province of Alberta, for typical "tall walls", such as walls exceeding the maximum height permitted by the building code. The project and development of the report/booklet will be managed by the Alberta Home Builders' Association on behalf of the Alberta Housing Industry Technical Committee (AHITC). AHITC is an alliance of major organizations (builder associations, Alberta New Home Warranty Program, Municipal Authorities and CMHC) which serves as the technical forum for the residential sector in Alberta. AHITC will be responsible for the production and the distribution of the booklet to their members.

CMHC Project Officer: Darrel Smith

CIDN: 2037 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

HOUSING DESIGN

AFFORDABLE, VERSATILE HOUSING.

This project will identify and describe house designs that enable a house to accommodate a range of housing types, sizes and needs by means of their adaptability. It will document the features of designs that have been built and it will explain their economic and use advantages. The set of designs to be included will cover all housing forms, from detached houses to apartments. This first guide on adaptable designs will be made available both in hard copy and electronic format via the Internet. The final report will be available in August 1998.

CMHC Project Officer: Fanis Grammenos

CIDN: 1783 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

DESIGNING NEW HOUSING FOR FUTURE DECONSTRUCTION.

The objective of this project is to facilitate easier de-construction in order to obtain maximum reuse and recycling of building components in a cost-effective and timely manner.

CMHC Project Officer: Darrel Smith

CIDN: 1828 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Vince Catalli, By Design Consultants
24 Spruce Street
Ottawa, Ontario, K1R 6N7

AVAILABILITY: Publication not yet available

FLEXHOUSING DESIGN DEMONSTRATION PHASE.

In January 1996, CMHC launched the FlexHousing Design Competition. The objective of the competition was to encourage the housing industry to explore new design concepts that integrate adaptable features into new housing. A national committee of community housing professionals judged the finalists in January 1997 and chose one national winner and three awards of merit. The national winner is Nouvelle Development Corp. of London Ontario. Awards of merit were given to: Ron Wickman Architects of Edmonton; McGill University; Avi Friedman, Anobid Construction of Montreal; Stephane Hazan Architects of Laval. The first demonstration house opened in Edmonton in October 1997. Additional demonstration houses will open in mid 1998. The project is one step in a long term CMHC initiative to promote accessibility and adaptability. More information is available on the CMHC Home page.

CMHC Project Officer: Tom Parker

CIDN: 1389 0300

Division: Research Division

STATUS: Ongoing Project

HABITATION ET FLEXIBILITÉ AU CANADA : BILAN 1991 : LA FLEXIBILITÉ VUE PAR LES ARCHITECTES.

The main objective of this research was to carry out a precise analysis of the architectural solutions provided by Canadian architects for solving the problem of flexibility, presented as a criterion in the "Vivre en Ville" competition launched by the City of Montreal in partnership with the Canada Mortgage and Housing Corporation and the Société d'habitation du Québec.

This research has allowed the preparation of an inventory of the broad trends among the majority, as well as minority forms of expression that can be qualified as innovative. Inspired by considerations that were more social than technical, architects have first and foremost focused their thinking on the practicality and speciality of dwellings within the problematics of passing time. No model of flexibility that would be generally applicable to all operations without adaptation has emerged from the research. Architects responded in a balanced way by favouring a context-based approach (type of operation, clientele, site, etc.), occasionally providing several practical solutions in the same project.

To respond to the multiple variations of residential groups and lifestyle changes that are currently observable in Western society, flexibility remains a major operating concept for the various housing stakeholders whether in policy, demand, programming or housing design, if we are to be responsive to occupants' expectations and to the goal of sustainable, lasting housing.

Prepared by Annie Chélin. CMHC Project Officer: Maria Hanna Siedlikowski. Ottawa: Canada Mortgage and Housing Corporation, 1997. (External Research Program).

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NEW HOMES IN OLD ENVIRONMENTS

The research project addresses the design problems raised by the implementation and integration of new homes in Canadian residential environments with more or less homogenous construction or in their bordering zones. By extension, this project concerns any new construction in an old environment, whether it involves recycling, renovation or expansion.

CMHC Project Officer: Glynis Kossatz

CIDN: 1450 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Pierre-Richard Bisson, Université de Montréal
P.O. Box 6128, Station CV
Montréal, Québec H3C 3J7

AVAILABILITY: Publication not yet available

LIGHT, SITE DENSITY AND FORM: A STUDY OF DAYLIGHT AVAILABILITY IN CANADIAN RESIDENTIAL BUILDINGS.

Natural lighting has been linked to physiological and psychological beneficial effects on humans. In general it is desirable and preferable to electric lighting. Recognizing that a large and increasing amount of our daily activity cycle is spent indoors, the questions this project addresses are: What are the light levels found in residential buildings of various forms and in different settings? Can these levels be predicted on the basis of certain elemental descriptors such as location, building form, and site density?

The study developed two new terms with which to understand, assess and express light availability in residential buildings. Total daylight Factor (TDF) and Overhang and Density Obstruction Factor. The Total Daylight Factor is used to assess or compare daylight availability in a dwelling unit over a year or a chosen period. For example, values of dwelling unit TDFs in the study ranged from 0.58% for a north facing apartment suite to 1.45% for a townhouse. Winter TDF values for south facing rooms are six times higher than north facing rooms. The second new term, Overhang and Density Obstruction Factor (ODOF), sums up the effect building elements and density have on light availability. Detached houses and townhouses show typically ODOFs above 80%, indicating only a modest loss in daylight attributable to exterior obstructions in their normal setting. By comparison, apartments show a factor of 50% attributable to other buildings and a 20% when the effect of balconies is added.

The analysis of typical housing examples paints an informative picture of the availability of daylight in dwelling units for the entire year and for the winter season.

This study sets the ground for a more extensive and detailed analysis of factors affecting daylight availability and levels in residential buildings. It also builds the foundation for a method to predict daylight performance of dwellings and for a means to assist building designers and planners in assessing the impact of design decisions on daylight performance.

Prepared by Enermodal Engineering Limited. CMHC Project Officer: Fanis Grammenos. Ottawa: Canada Mortgage and Housing Corporation, Research Division, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
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Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

MONTREAL: A GREAT TRADITION OF MEDIUM-DENSITY HOUSING

This project aims to highlight the adaptation processes of housing and building types throughout the various phases of the evolution of "plex" formulas (duplex, triplex, fourplex, fiveplex...) in Montréal over four construction cycles between 1866 and 1935.

CMHC Project Officer: Fanis Grammenos

CIDN: 1455 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: David B. Hanna, Université du Québec à Montréal
P.O. Box 8888, Station CV
Montréal, Quebec H3C 3P6

AVAILABILITY: Publication not yet available

PASSIVE SOLAR TECHNIQUES FOR CANADIAN HOUSES.

This CMHC advisory document is the only authoritative Canadian reference on passive solar design. It has been updated and enhanced to include advances in systems and components and to reflect a better understanding of the design issues. Complementing this document will be a CD-ROM disk which will contain a window sizing program and a window manufacturers and product list. The advisory document will be available in May 1998.

CMHC Project Officer: Fanis Grammenos

CIDN: 1241 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INDOOR ENVIRONMENT

ASSESSMENT OF THE INDOOR AIR QUALITY OF A SUITE FOR AN ENVIRONMENTALLY HYPERSENSITIVE OCCUPANT.

This project analyzes and documents the findings of a comparative case study between an environmentally hypersensitive (EH) suite and a conventional suite in a newly constructed apartment building, located in Victoria, BC. This report documents the design and construction of the EH unit, and how it differs from a conventional unit in the same building. The indoor air quality of the EH unit was monitored and compared with that of the conventional unit and the outdoor air quality. Analysis was conducted once prior to occupancy and twice after occupancy of the units. An interview with the occupant of the EH unit was conducted to document the tenant's satisfaction and compatibility with the unit.

There was considerable effort made in designing the EH suite, and for the most part, the suite works well. Although improvements could be made in the design of the EH suite, the most significant improvements in design could be in how the suite might be incorporated in the larger design of the apartment block in order to promote integration of the occupant without compromising the occupant's health.

VOC's, formaldehyde, mold, dust and air change effectiveness were measured and compared between the EH suite and the conventional suite. The measurements showed lower formaldehyde levels and higher ventilation rates in the EH suite. The EH suite was less leaky in terms of air tightness. The results of the TVOC measurements were not definitive. Further measurements are needed to ascertain if chemical contaminants are being brought into the unit.

The EH suite at the Selkirke Apartments provides the occupant with an indoor air quality that is incrementally better than her previous accommodation. While the situation is by no means perfect for the occupant, she is coping better with her condition. If one uses the criteria of incremental improvements in order to assess the success of the EH suite, one may conclude that it is successful.

Prepared by Sheltair Scientific Ltd. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Manager: Virginia Salares. Ottawa: CMHC, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation,
700 Montreal Road, Ottawa, Ontario, K1A 0P7, Tel.: 613-748-2367 or 1-800-668-2642,
Fax.: 613-748-4069, Email: chic@cmhc-schl.gc.ca

INDOOR ENVIRONMENT

CONSULTATION ON MATERIALS EMISSIONS PROJECTS

The Saskatchewan Research Council, as an outside expert, has been contracted by CMHC to evaluate the emissions-related projects being carried out by the Corporation with the intent of making recommendations for future research directions.

CMHC Project Officer: Jim White

CIDN: 1690 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

DEVELOPMENT OF MATERIAL EMISSION TEST STANDARDS

Improved test standards for emissions from caulks and sealants and urethane foam are currently being developed. These standards, currently in draft, are now being considered within the American Society for Testing and Materials (ASTM) process. NRC/IRC has developed a draft emission test standard for VOCs from pressed wood products. Revisions are being made to these draft standards in response to an ASTM committee ballot and will be re-submitted again this year. It is anticipated that the ballot will be passed for inclusion of these standards into the ASTM process in 1998.

CMHC Project Officer: Jim White

CIDN: 1244 0201003

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

EVALUATION OF POLLUTANT SOURCE STRENGTHS AND CONTROL STRATEGIES IN AN INNOVATIVE HIGH-RISE BUILDING

CMHC is studying the emission rate of pollutants from a number of construction and finishing materials as well as the indoor air quality and ventilation rates in several suites of the Montreal IDEAS Challenge building. The purpose of the study is to characterize the relationship between material emissions, ventilation strategies and indoor air quality in this building. The impact of occupant related sources of air pollutants will also be studied.

CMHC Project Officer: Duncan Hill

CIDN: 1557 0300001

Division: Research Division, Panel on Energy Research and Development

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INDOOR ENVIRONMENT

EVALUATION OF THE BARRHAVEN MULTI-UNIT HOUSING PROJECT FOR THE ENVIRONMENTALLY HYPERSENSITIVE

This survey of the occupants and the landlord of a Barrhaven (Nepean, Ontario) housing project for the environmentally hypersensitive assessed whether the occupants' needs are being met and what advantages or limitations are encountered with this type of housing. For the most part, the occupants expressed satisfaction with their units. Lighting and aesthetics were considerations in addition to air quality which the occupants found very important. This study is helpful for others who are planning similar projects.

CMHC Project Officer: Virginia Salares

CIDN: 1823 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

A GUIDE TO MECHANICAL EQUIPMENT FOR CLEAN INDOOR ENVIRONMENTS

Complementing the "Building Materials for the Environmentally Hypersensitive", this publication deals with heating, ventilating, air and water purification equipment. The document is a reference guide for selecting new mechanical equipment for new construction or retrofits. The document includes discussions of the applicability of the equipment to environmentally hypersensitive individuals. The guide will be available in the fall of 1998.

CMHC Project Officer: Virginia Salares

CIDN: 1031 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HEALTHY MATERIALS, AN INTERNATIONAL COMMUNIQUÉ ON MATERIAL EMISSIONS

This periodical, designed specifically for researchers (worldwide) on material emissions, is a communication vehicle on issues, progress, contacts and standards. It has been set-up on the Internet as a twice-yearly publication. Hard copies are also available from CMHC. Four issues are currently available, with two more expected in 1998.

CMHC Project Officer: Jim White

CIDN: 1244 0201

Division: Research Division

STATUS: Ongoing Project

INDOOR ENVIRONMENT

HOUSING NEEDS OF THE ENVIRONMENTALLY HYPERSENSITIVE: SOCIO-ECONOMIC/HEALTH FACTORS: FINAL REPORT.

This study surveyed the housing needs of 200 environmentally hypersensitive individuals in Canada. The survey gathered information related to the socio-economic characteristics of this group and their current housing situation, needs and preferences. The results are used to discuss the market potential for clean air housing, the long-term social and economic implications of being afflicted with environmental hypersensitivity and program, education and research issues that would be helpful in their housing.

Prepared by Ekos Research Associates Inc. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Manager: Virginia Salares. Ottawa: CMHC, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
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Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

INDOOR AIR POLLUTION FROM ATTACHED GARAGES.

CMHC is contributing to a Health Canada/Environment Canada project investigating the infiltration of garage-based pollutants into houses. Twenty-five Ottawa houses have been tested to determine the leakage area between the house and the attached garage. Pressure differentials were recorded and pressure testing was repeated during the winter months. The current work includes modelling of the IAQ implications and monitoring of pollutant entry when the garage is occupied by a "calibrated" car. Data analysis and modelling are in progress during spring 1998. A report on the garage airtightness testing will be distributed by CMHC in late spring 1998.

CMHC Project Officer: Don Fugler

CIDN: 1910 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INDOOR AIR QUALITY TRAINING PROGRAM.

A program to train indoor air quality problem inspectors has been developed and piloted. The program consists of a three-day course, followed by a field training phase. Pilot testing indicated that candidates for the program should have some expertise in building science and mechanical systems. A one-day "Let's Clear the Air" seminar has also been developed for other industry interest groups. This one-day seminar is a pre-requisite to the three-day evaluators' course. Eleven trainees took the first three-day course and are going through the apprenticeship stage.

The 1998 schedule will include a new one-day field training session for building officials and public health inspectors in addition to the one-day seminars and the three-day course.

CMHC Project Officer: Virginia Salares

CIDN: 1623 0300017

Division: Research Division

STATUS: Ongoing Project

INTEGRATED PEST MANAGEMENT FOR COCKROACH CONTROL IN HOUSING.

A booklet on controlling cockroaches in a safe way was developed by the City of North York Public Health Department and Metropolitan Toronto Teaching Health Unit and partly funded by CMHC. The consumer booklet teaches homeowners how to control cockroaches by using integrated pest management (IPM) methods. IPM minimizes or avoids chemical pesticides. A technical manual for property managers and public health professionals was also prepared.

CMHC Project Officer: Virginia Salares

CIDN: 1691 0301001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

THE PRINCE EDWARD ISLAND BIRTH COHORT STUDY OF MOLD IN HOMES.

This joint study between CMHC, Agriculture Canada, Health Canada and others will look at several hundred homes in Prince Edward Island to determine the biological exposure, house performance parameters and energy use characteristics of a statistically-representative set of houses occupied by newborn babies. Part of the study will follow the health of these babies to determine the degree to which damp and moldy houses result in increased infant health problems. Ongoing sampling of the house biological matter will occur in a subset of the "good" and "bad" houses. The first year of the study is underway and additional funding is being solicited for ongoing years.

CMHC Project Officer: Jim White

CIDN: 1618 0200001,
1618 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RELIABLE METHODS FOR HEAT EXCHANGER LEAKAGE TESTING

The goal of this project was to select, field test and demonstrate reliable and quantitative methods for furnace heat exchanger leakage testing. A survey was conducted on heat exchanger leakage test methods used by 40 Canadian and American utilities. This report is currently available from CMHC.

Research is also being conducted to test thirteen furnaces that had been "red-tagged" in the field. A test protocol, that was selected as being the most reliable for correctly predicting high levels of furnace heat exchanger leakage, is being used. The Canadian Gas Research Institute (CGRI), when looking into variations upon this basic test, found flaws in each test. The gas industry is unwilling to proceed with further training and implementation until they are satisfied that a more reliable test can be established. An additional test procedure is being looked at by CGRI in the spring of 1998, and will be field tested by the gas industry, if laboratory tests prove it to be accurate.

CMHC Project Officer: Don Fugler

CIDN: 1505 0200004

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

SOIL GAS VOC INTRUSION RESEARCH

CMHC is contributing to a multi-agency project which is looking at the rate and predictability of volatile organic compounds (VOC) into buildings located on contaminated soils. The contractors have reviewed the available models and are collecting data at a BC test site.

CMHC Project Officer: Don Fugler

CIDN: 1826 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Martin Adomait, President, Adomait Environmental Solutions Inc.
160 Cyprus Drive
Kitchener, Ontario, N2M 4R5

A STUDY OF HOUSE RETURN AIR SYSTEMS USING FLOOR JOIST SPACES.

Research was conducted on air in houses that is distributed through the ducting system consisting of supply ducts and a return air plenum. Floor joist spaces are being used as return plenums in new construction and this study characterizes the indoor air in a number of houses with return air plenums made of all metal, combinations of metal, solid wood, plywood or oriented strand board. A Research and Development Highlight sheet is being prepared.

CMHC Project Officer: Virginia Salares

CIDN: 1704 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

A STUDY OF RECURRING MOLD PROBLEMS ON THE ROSEAU RIVER RESERVE IN MANITOBA.

This study will survey several houses on the Roseau River Reserve, with emphasis on remediating recurring mold problems. The survey will include houses that were flooded and previously cleaned and remediated, houses that were flooded but not yet remediated and houses that were not flooded but appear to have mold and mildew problems. The study will serve as an advisory document on the technical aspects of the remediation as well as provide a database for the indoor air quality characteristics of houses that have been flooded. The work will be undertaken in the spring of 1998.

CMHC Project Officer: Virginia Salares

CIDN: 2036 0200001

Division: Research Division

STATUS: Planned

*** NEW ***

AVAILABILITY: Publication not yet available

A STUDY ON THE EFFECT OF CONTROLLING THE HOME ENVIRONMENT ON ASTHMA.

Six houses having one or more individuals suffering from asthma and in which the occupant's symptoms are linked to the house were selected for further analysis. IAQ problems in these houses were evaluated and recommendations for remediation were provided to the homeowners. Toxic molds were found in each of the six houses. Five of the homeowners proceeded with the remediation. Compliance with the recommendations varied from partial to full. Monitoring is currently being performed on the houses after the remediation. The health status of the asthmatic occupant will be followed by their physicians. This research is the first of its kind that studies the correlation between asthma and improvements to the air quality in the home.

CMHC Project Officer: Virginia Salares

CIDN: 1621 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

SUPPORT FOR THE CONSORTIUM FOR MATERIAL EMISSIONS AND INDOOR AIR QUALITY MODELLING.

CMHC is an active supporting member on the steering committee and technical committee of a consortium established by the National Research Council, Institute for Research in Construction to develop protocols for testing materials and furnishings and for modeling the impact of those emissions on indoor air quality.

CMHC Project Officer: Jim White

CIDN: 1244 0200004

Division: Research Division

STATUS: Ongoing Project

TASK FORCE ON MATERIAL EMISSIONS.

This Task Force meets twice annually to discuss issues related to chemical emissions from building materials and to help direct Canadian efforts in this field, including prioritizing future activities. During a previous meeting held in the fall of 1995, three jointly-funded projects were approved. The draft final report, "Round-Robin Testing of Volatile Organic Compounds (VOC) Emissions from Common Building Materials" has been received. The final report is expected to be completed and available in May 1998.

The final of the paint report, "A Review of VOC Emissions and Drying Mechanisms for Interior Paints and Coatings" and the odour study, "Material Odour Emission Test Methods: Review and Evaluation" are available from CMHC's Canadian Housing Information Center. Seven additional resolutions concerning material emissions and health and future research were adopted by the Task Force during a January 1998 meeting.

CMHC Project Officer: Jim White

CIDN: 1894 0300001

Division: Research Division

STATUS: Ongoing Project

MANUFACTURED HOUSING

COMPARISON OF THE NATIONAL BUILDING CODE, CAN/CSA-Z240 MH AND HUD PART 3280 MOBILE HOMES.

In Canada, mobile homes are usually built to the CAN/CSA-Z240 MH standard, (Z240). The National Building Code, (NBC), forms the basis for regulating all site-built housing. In the United States, the mobile home industry operates under the Housing and Urban Development (HUD) code. The MHI of Canada (MHIC) has suggested that there may be situations where the NBC and its provincial equivalents or the Z240 standard have more stringent requirements than are required for occupant health and safety. MHIC also believes that there may be other approaches to the construction of housing that will deliver an equivalent unit of housing but at a reduced cost. CMHC, in association with MHI Canada and the Canadian Manufactured Housing Institute (CMHI), is undertaking a comparative study of practices under the three different approaches to examine if there are non-health and safety related code/standard differences that affect production costs.

CMHC Project Officer: Doug Pollard

CIDN: 1939 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

INVENTORY OF CANADIAN COMPANIES INVOLVED IN HOUSING SYSTEMS.

The purpose of this project is to develop an inventory of Canadian companies involved in housing systems, and to gather descriptive business information on those companies currently exporting housing systems.

CMHC Project Officer: Louis Musto

CIDN: 1771 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

OPTIMUM VALUE ENGINEERING STUDY OF THE CANADIAN MANUFACTURED HOUSING INDUSTRY.

The Canadian Manufactured Housing Institute (CMHI), with CMHC, undertook an Optimum Value Engineering (OVE) study to examine the product engineering and manufacturing processes of the Canadian manufactured housing industry. Phase I of the project comprised literature reviews of international advances in manufactured housing, site visits to US and Canadian plants and an industry survey questionnaire. Among the important findings are the significantly expanded role for computers in the industry and the lack of use of foam adhesives in Canadian manufactured housing. Reports from Phase I can be obtained from the CMHI. Phase II began in August 1997 and undertook further studies of the potential for use of foamed adhesive to attach interior finish materials to framing, and less material-intensive floor-framing details that retain the necessary structural properties. Phase II is now complete and the final report will be available in the summer of 1998.

CMHC Project Officer: Ken Rauch

CIDN: 1597 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

"RORO" MODULAR HOME SHIPPING SYSTEM.

This report discusses the potential use of RORO vessels as a shipping system for exporting modular housing components to Japan. The work looks at the modular concept, compares its costs to the more traditional panelized housing export product, estimates a potential market and discusses the system's advantage.

As one of the core elements in the report, the chapter on shipping encompasses four major sections. Section one discusses the various regulatory, industry and practical size limitations which will impact any proposed module or associated shipping system. Section two looks at various shipping options from modern containerization to traditional break-bulk cargoes. It explains the physical and operational environments one will find at the various port facilities and on the vessels themselves. The third section integrates the findings arising from the first two parts and proposes alternate methodologies and equipment for transporting modules either from plants within an hour of the port of export or from intermediate distances ranging up to 300-400 km. The final section compares the costs of shipping two identical homes to a common construction site in Japan. One home is a panelized structure and finishing materials which are loaded into two 40' containers, while the other home is a six module residence wherein the modules are equipped to be towed on their own wheel assemblies.

The report also reviews modular design as well as its technical requirements and attributes. It discusses various functional requirements, cultural attributes and some simple design options whose use can significantly improve on the somewhat boxy appearance which plagues many other modular homes. There is also an extensive discussion of technical issues such as structural anchors, inter-module connectors, joint finishing between modules, fire safety and environmental or envelope integrity. In addition, a detailed comparison is made of the differences in the costs associated with producing competing panelized and modular systems in a Canadian plant and then assembling the materials into identical homes in Japan.

Prepared by Ian Bazley. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Don Hazleden. Ottawa: CMHC, 1997 (External Research Program).

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
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Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

VIDEO: THE FUTURE OF MANUFACTURED HOUSING: ZONING AND PLANNING ISSUES.

Manufactured housing, as an industry, has long suffered from the stereotypical view of the "trailer park" as typified in old American movies. The modern day mobile or modular home, and the typical community within which it is located are a far cry from these old trailer parks. Manufactured housing can be a very viable and affordable alternative to site-built housing. However, developers often have a problem getting planning or zoning approval for new developments. This project proposes to develop a video that shows current best practices in manufactured housing community design and the associated planning and zoning approaches that can produce desirable manufactured housing communities.

CMHC Project Officer: Doug Pollard

CIDN: 1948 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Video not yet available

B.C. MOISTURE PROBLEMS - PHASE II.

Over the past 12 months CMHC has conducted research which has been instrumental in leading an industry wide consortium in the development of solutions to technical problems associated with wood frame apartment building envelope construction in the coastal areas of BC. The first part of the program, a field survey, has now been completed and has confirmed that the problem is likely attributed to incorrect wall design and construction, leading to ingress of exterior moisture followed by inadequate drying rates. Two steering committees are being formed from the Building Envelope Research Consortium's membership. The project will involve retaining the services of consultants to test and monitor new details and wall constructions; to adapt the two currently available Best Practice Guides for wood frame building envelopes and flashings for the coastal region of British Columbia; to develop a Quality Assurance Protocol which would be specific to the wood frame industry envelope design and construction process; and to develop a training program in partnership with the CHBA and the AIBC.

CMHC Project Officer: Jacques Rousseau

CIDN: 1816 0300006-8

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BASEMENT WALLS THAT DRY.

Research has shown that finished basement walls, with chronic wetting, produce molds dangerous to human health. This research suggests that no basement with a history of dampness should be finished until the moisture problems are completely remedied. This approach however ignores the reality that few people will spend the several thousand dollars to fix what they perceive to be inconsequential leaks. This project will attempt to find quick-drying basement wall systems, in hopes of being able to recommend these systems for marginal basements. A variety of basement insulation systems are being tested in University of Alberta test huts over the winter and spring of 1997-98. They have been subjected to a mid-wall leak and a 15 cm flood to measure the drainage and drying characteristics.

CMHC Project Officer: Don Fugler

CIDN: 1797 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BUYING A NEW HOUSE THAT WON'T GROW MOLD.

This booklet, one of a planned series, will identify the important code-related and beyond-the-code requirements, for the construction of new houses, that will resist growing mold even in moist climates and with heavy occupant loading. A 'draft' is in the final review stage.

CMHC Project Officer: Jim White

STATUS: Ongoing Project

Division: Research Division

AVAILABILITY: Publication not yet available

FIELD TESTING OF MOISTURE IN STRAW BALE HOUSES.

Straw bale construction is an innovative construction technique that is gaining popularity, particularly for rural houses. While these structures seem to be working well in the dry American southwest, the birthplace of the straw bale housing movement, it is unclear how well they will withstand extended periods of cold and damp conditions. This initiative is funding three small local investigations of straw bale house moisture content: one in several houses in Alberta/BC, one in older straw bale homes in the Gatineau area north of Hull, Québec and one in several houses in Nova Scotia.

The Quebec investigation is completed and a report is available. The older straw structures were showing signs of straw rot where the straw was not adequately protected from soil-based moisture. Data is being collected from the Nova Scotia and Alberta houses and added to the information collected from other straw bale houses that are participating in an informal, international, cooperative monitoring project. The first year of testing should be complete by May 1998. Data analysis will follow.

CMHC Project Officer: Don Fugler

CIDN: 1867 0300002,
1867 0300004

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: See above

GUIDANCE DOCUMENT ON RESIDENTIAL DRAIN TILE INSTALLATION AND MAINTENANCE.

The Center for Drainage Studies at McGill University, Montréal, Québec, has drafted a publication on the installation and maintenance of drain tile around the foundation perimeter of Canadian houses. McGill surveyed contractors across the country to ascertain regional patterns of drain tile installation and failure. The guide is being reviewed prior to wider distribution.

CMHC Project Officer: Don Fugler

CIDN: 1797 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

METHODS FOR THE REMOVAL OF EXCESSIVE ICE BUILD-UP ON FLAT OR SLOPED ROOFS.

This project studied safe and effective methods for de-icing flat or sloped roofs used in Montreal, especially after the freezing rain ice build-up in eastern Canada in January 1998. Salts, heating cables, plastic tents, hot water, steam, and other methods were used to remove ice from flat and sloped roofs. Generally, the most effective methods for a homeowner to use involved putting heating cables on the roof. Some of the de-icing salts were also useful. An "About Your House" factsheet for the public, based on the research findings, is currently being prepared.

CMHC Project Officer: Don Fugler

CIDN: 2025 0200003

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

MOISTURE & MOLD

PERFORMANCE EVALUATION OF WATER REPELLENTS FOR ABOVE GRADE MASONRY.

The objective of this project is to evaluate the performance of various water repellents for above grade masonry on a comparative basis and develop practical methods to evaluate their effectiveness. This evaluation will be based on lab analysis and field testing as well as a literature review to find available information on water repellent performance. The initial part of this study, Phase I will be conducted under the CMHC External Research Program and will examine the issue of water infiltration while Phase II will examine exfiltration.

CMHC Project Officer: Jacques Rousseau

CIDN: 1696 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PREVENTING MOISTURE AND MOLD PROBLEMS IN YOUR HOME; CONSUMER'S BROCHURE.

This handout will advise consumers what they must do to prevent future mold problems, once a clean-up (and renovation) has been performed on their home. It covers occupant habits, maintenance, keeping indoor surfaces warm, use of ventilation systems, etc.

CMHC Project Officer: Jim White

CIDN: 1030 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RAIN PENETRATION CONTROL SEMINAR.

Water penetration is a frequent, recurring problem for building owners, leading to damage of building components, interior finishes and building contents. It frequently leads to high repair costs and possible litigation. Over the past few years, research undertaken by CMHC, has contributed to the understanding and the prevention of rain penetration. In particular the pressure-equalized rainscreen has been applied and refined. In this seminar the causes of rain penetration will be examined. The results of CMHC research will be presented, along with design features and practical details, which will help prevent rain penetration in a variety of wall types. This full day seminar is targeted to architects, engineers, specifiers, builders, developers and building owners concerned about rain penetration and how to prevent it. The seminars will be presented in Toronto, Winnipeg, Edmonton, Vancouver, Montreal and Quebec City. This seminar was developed in cooperation with the Canadian Masonry Association, the Canadian Precast Concrete Institute and the Exterior Insulated Finish Systems (EIFS), curtain wall and steel manufacturers.

CMHC Project Officer: Jacques Rousseau

CIDN: 0838 0303005

Division: Research Division

STATUS: Ongoing Project

MOISTURE & MOLD

RE-INSULATION OF EXISTING FLAT-ROOF MULTI-FAMILY BUILDINGS IN QUÉBEC.

A joint project with Hydro Québec to examine ways of re-insulating low-rise multi-family buildings for energy efficiency, without causing moisture problems in the attic. Field testing was complete in early summer 1997. A final report is currently being prepared.

CMHC Project Officer: Don Fugler

CIDN: 1377 0801001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

A RENTER'S GUIDE TO MOISTURE AND MOLD.

This four page consumers guide presents a summary of what causes mold and moisture problems, why we are concerned about mold, what humidity limitations a housing unit has, and the responsibilities of both the occupant and the landlord in cleaning up, fixing and preventing mold problems. Industry and user reviewers are currently being solicited.

CMHC Project Officer: Jim White

CIDN: 1030 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SOLVING MOISTURE PROBLEMS IN A HOME: A RENOVATOR'S GUIDE.

This guide for renovators includes renovation solutions required in moisture troubled houses to prevent the recurrence of moisture and related mold problems. Included in the guide will be sections on water entry control, insulation, ventilation and plumbing/piping tips relevant to Canadian housing, as well as information from the draft document, "Modifying Your House So It Won't Grow Mold."

CMHC Project Officer: Jim White

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

STACHYBOTRYS CHARTARUM: CONSUMER'S BROCHURE.

This brochure will advise consumers who have a *Stachybotrys chartarum* problem in their house what to expect in the clean-up, as well as the remedial measures needed to prevent recurrence. It is targeted specifically to those who are also pregnant. They are advised to have the mold problem cleaned up and the house renovated, quickly and thoroughly, to prevent future mold growth and protect the health of their baby. It is being written for a committee of concerned health officials, several in the USA, who have discovered serious health effects from exposure to large amounts of this mold.

CMHC Project Officer: Jim White

CIDN: 1367 0203

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NORTHERN HOUSING

INNOVATIVE FOUNDATIONS, HEATING & VENTILATION.

This R&D&C (research, development, commercialization) project and first stage monitoring is complete and a report due before the end of 1998. CMHC, Yukon Housing Corporation (YHC) and Yukon Energy partnered in building two research/demonstration houses in Dawson City, Yukon. This work is a continuation of previous successes in R&D&C of the space frame foundation technology now being exported to Alaska. The thrust of the current foundation work is to reduce cost, develop a technology that can be locally manufactured and reduce the height of the crawl space.

A torque tube HSS steel section is under one house. The other house will be an extension of the sheet metal reinforced plywood monocoque technology resting on three bearing points. Lots of ground movement has been reported so the test site is proving to be a good demonstration. After a review of northern and remote technology, the heating and ventilation systems incorporate and optimize energy efficiency, minimal equipment and sustainable ventilation operation. Construction is complete and the houses are occupied. Commissioning of the project was a large task and the systems appear to be running efficiently at about half the energy consumption of a typical northern house. The mechanical technology was used on another YHC project at substantial capital savings and with some modifications appears to be the technology of choice. Work is underway to develop a more cost effective and simple foundation system.

CMHC Project Officer: Rob Duncan

CIDN: 1676 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NORTH WEB-SITE.

The purpose of this partnership project was to design, establish and maintain a dedicated NoRTH Web-Site for a two year period. The project partners are CMHC, Alaska Housing and Finance Corporation, and Yukon College. The web-site includes relevant technical information such as factsheets of research reports and the Frostline newsletter. It also includes discussion groups to provide a means of ongoing and current communication. The web-site has links to other relevant web-sites and can be visited at www.NoRTH-RTHN.org. It is scheduled to be fully operational by the summer of 1998.

CMHC Project Officer: Darrel Smith

CIDN: 1886 0200001

Division: Research Division

STATUS: Ongoing Project

THE CANADIAN ASSOCIATION OF HOME AND PROPERTY INSPECTORS INITIATIVE.

The Canadian Association of Home and Property Inspectors (CAHPI) is a newly formed association that will represent the private home inspectors in Canada. This association is comprised of a number of national and provincial associations, including some of the major franchises, and a number of independent inspection firms. CAHPI currently represents over 600 private home inspectors, but it is anticipated that other, non-affiliated private home inspectors will increase this number in the future. Formal agreements and establishing their future requirements is currently being undertaken. A CAHPI Board has been established and they are now proceeding with setting-up and determining the responsibilities of the various committees such as, By-Laws, Accreditation and Certification, Strategic Relations, Education, Standard of Practice and Code of Ethics, and Discipline. CMHC was asked to continue with its supportive role.

CMHC Project Officer: Darrel Smith

CIDN: 1962 0200002

Division: Research Division

STATUS: Ongoing Project

*** NEW ***

THE CANADIAN RENOVATION INDUSTRY AND THE INTERNET: USAGE PATTERNS, 1998-2001.

The objective of this project is to survey renovators about their use of e-mail, web-sites, and interactive online communications.

CMHC Project Officer: Darrel Smith

CIDN: 2015 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Donald M. Caskie
R.R.2
Paris, Ontario
N3L 3E2

*** NEW ***

AVAILABILITY: Publication not yet available

THE HEALTHY HOUSING RENOVATION PLANNER.

The purpose of this project is to develop a consumer renovation book that will focus on Healthy Housing. This book will look at the various renovation projects commonly undertaken and will provide the consumer with the information they require to plan a Healthy Housing renovation. The book is expected to be available by the fall of 1998.

CMHC Project Officer: Darrel Smith

CIDN: 1760 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RENOVATION & INSPECTION

HOW HEALTHY IS YOUR HOUSE: CMHC HOMEOWNER'S AND HOMEBUYER'S CHECKLIST FOR MAINTENANCE AND REPAIR.

The current CMHC's Homeowner's and Homebuyer's: Inspection Checklist for Maintenance and Repair is being revised to both update and include a Healthy Housing evaluation "tool". It will provide homeowners and homebuyers with a pre-purchase or pre-renovation guide for performing an inspection on their house. Physical condition, IAQ, energy and environmental and maintenance and repair information will be included in the document. It will be beneficial in enabling consumers to make more informed decisions prior to hiring the assistance of a private home inspector should the need arise. This advisory document will be available in the fall of 1998.

CMHC Project Officer: Darrel Smith

CIDN: 1901 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INTEGRATING HEALTHY HOUSING AND ENERGY EFFICIENCY IN MAJOR RENOVATIONS.

Homeowners who undertake major renovations often miss the opportunities to make their houses healthier and more energy efficient. This project will target homeowners in the midst of major renovations and examine what changes would improve their designs. It will also look at where the homeowners and renovators find the information on which they base their design decisions. A pilot study of two houses is complete. The contractor is looking for ways to encourage participation by both the homeowner and the contractor, and is finding it difficult to obtain contractor involvement in the survey.

CMHC Project Officer: Don Fugler

CIDN: 1898 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RENOVATION DEMONSTRATION CASE STUDY BOOKLET.

CMHC and Natural Resources Canada in partnership with CHBA undertook a pilot Red Deer Project '94 renovation demonstration and six other similar projects in 1996/97. The Red Deer Project '94, conducted by the Red Deer Home Builders' Association, and six other projects, 5 with the local HBA's in Annapolis Valley, Ottawa-Carleton, Kitchener-Waterloo, Fraser Valley, and North Okanagan and one with APCHQ in Region de l'Estrie will be presented in a case study booklet. This publication will also include information for both homeowners and renovators on Healthy Housing, energy retrofits, and the value of using qualified renovators for their renovation work. The booklet will be available in the fall of 1998.

CMHC Project Officer: Darrel Smith

CIDN: 1530 0300010

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RENOVATION OF GENERIC HOUSING STYLES - POST-WAR ONE-AND-A-HALF STOREY.

The objective of this project is to provide consumer information on typical approaches to the repair and renovation of post-war one-and-a-half storey houses. Criteria for these approaches will include occupant lifestyle and needs, structural and maintenance requirements, "Healthy Housing" improvements (including environmental and energy-efficiency), and the impact on home equity and resale value. A draft version is currently being reviewed by homeowners, renovators, and building scientists.

CMHC Project Officer: Don Fugler

CIDN: 1430 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RENOVATOR TRAINING IN CANADA: AN EVALUATION AND SITUATION REPORT.

Through the use of surveys, telephone conversations and focus groups, this project will evaluate the current situation with respect to renovation contractor training in Canada. A situation report will be produced to determine who else is providing training for the residential construction industry with a focus on the renovator. Other issues related to this include marketing, financing, existing materials, relationship to certification, native initiatives, and options for delivery that reach beyond current CHBA membership, (ie: community colleges, private firms, etc.). The methods of delivery will also be researched (ie: five day, correspondence, computer-based, etc.).

CMHC Project Officer: Darrel Smith

CIDN: Plan 1-0268

Division: Research Division

STATUS: Planned

AVAILABILITY: Publication not yet available

*** NEW ***

RENOVATORS AND TECHNOLOGICAL CHANGE IN THE SINGLE FAMILY OWNER-OCCUPIED HOUSING MARKET IN CANADA.

The objective of this project is to examine the dissemination of information about new technology to renovators and the utilization of the new technology in their renovations of owner occupied single family detached and semi-detached homes in Canada between the years 1990 and 2005. The technology will include that used by the major housing trades, including electrical, mechanical, carpentry, cladding, etc.

CMHC Project Officer: Darrel Smith

CIDN: 1837 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Donald M. Caskie
R.R.2
Paris, Ontario
N3R 2E2

AVAILABILITY: Publication not yet available

RENOVATION & INSPECTION

RENOVATOR'S TECHNICAL GUIDE.

This new publication is a comprehensive technical guide that will assist renovators, inspectors and the knowledgeable DIYer audiences with their renovation/energy retrofit decisions and/or advice. It follows the House as a System approach and includes current information related to residential renovation, energy retrofit and Healthy Housing. The guide focuses on why problems occur, how to avoid them and how not to create new ones as you renovate a house. It is a companion publication to the existing "Renovators Resource Guide" which focuses on the business management aspects of renovation. This publication will be available in June 1998.

CMHC Project Officer: Darrel Smith

CIDN: 1592 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

TOXIC MOLD CLEAN UP PROCEDURES: A GUIDE FOR CONTRACTORS.

This guide provides advice to renovators on how to clean up a house contaminated with toxic molds, such as *Stachybotrys chartarum*, including how to protect workers and occupants. A separate guide will be developed on how to renovate to prevent moisture problems (ventilation, moisture source control and surface temperature control). The first two drafts have been reviewed by public health officials (including the Center for Disease Control in Atlanta, Georgia) and selected mold and building science researchers and their comments incorporated. The format of the document is designed so that it could be used contractually by public health agencies. The document is in the final review stage.

CMHC Project Officer: Jim White

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CMHC'S HEALTHY HOUSE IN TORONTO.

This publication provides information on CMHC's Healthy House located in Toronto. Five years ago architect Martin Liefhebber's off-grid self-sufficient house was one of two winners of Canada Mortgage and Housing Corporation's (CMHC) Healthy Housing Design Competition. The winning design met CMHC's criteria that new housing technologies and design be workable, available and affordable for the occupants and the community while going easy on the planet.

Although there are many Canadian homes that have energy and water conservation features, Liefhebber's design integrates the additional Healthy Housing principles of good indoor air quality, affordability and environmental responsibility. The four-storey, semi-detached house is located in an established neighbourhood in downtown Toronto, and because the house requires no hydro, water or sewer connections, it was possible to build on a lot that normally would be too expensive to develop.

The publication covers the thermal energy system and water treatment systems, details the design team, and describes the products used in the house construction.

Ottawa: Research Division, Canada Mortgage and Housing Corporation, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NOTE : Aussi disponible en français sous le titre : *La maison saine de la SCHL à Toronto.*

CONSTRUCTION RESOURCE MANAGEMENT COURSE.

A private and public sector consortium has been established to develop a methodology for assisting industry to better understand, control and reduce the levels of construction, renovation and demolition (CRD) waste. To date, the partners include Industry Canada, Canada Mortgage and Housing Corporation, Alberta Environmental Protection, NWT Department of Resources, and PCL Constructors Canada Inc. Phase I will be development of a CRD training tool that will be published in a CD-ROM format and available to the consortium partners. The tool will be based upon and adapted from existing construction waste reduction courses that have been designed to clarify waste reduction issues. Phase II will consist of an Internet based CRD project management course that will: provide current resource management information and case-specific solutions; contribute to the development of standard managerial practice; promote widespread communication of the best resource recovery techniques, contribute to economic growth and job creation; promote long-term behavioural change; and help industry associations and government departments meet mandated environmental targets. The project has a planned completion date for the fall of 1998.

CMHC Project Officer: Darrel Smith

CIDN: 2032 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

SUSTAINABLE DEVELOPMENT & HEALTHY HOUSING

DEMONSTRATION OF HEALTHY HOUSING ON RESERVE.

This project formerly reported as "Water & Sewage Disposal in Northern & Remote Locations" will now form part of the Northern Healthy House initiative. The objectives are to support the design, construction and demonstration of five on-reserve Healthy Houses in northern and southern Ontario during 1998/99. This initiative will demonstrate alternative Healthy Housing designs with features appropriate for remote communities. Features such as preferred alternatives to conventional energy, water and sewer infrastructure will be researched. Construction will commence in the spring of 1998 with the public demonstration beginning in the fall of 1998. House construction will be by locally trained trades and specialists. A CMHC report will be produced detailing house costs and benefits, designs and systems at the completion of the project.

CMHC Project Officer: Chris Ives

CIDN: 1969 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

HEALTHY HOUSING COST-BENEFIT STUDY.

The objective of this project was to identify the cost and the benefits of applying Healthy Housing principles, i.e. Occupant Health, Energy Efficiency, Resource Efficiency, Environmental Impact, and Affordability to the construction and renovation of homes. The cost benefit analysis treats the Healthy Housing features individually for the benefit of both the renovation market and for new construction. The study includes Healthy Housing capital costs and effects on the operating costs, such as reductions in energy or water consumption, and identifies the hidden benefits such as occupant health and durability of materials.

CMHC Project Officer: Darrel Smith

CIDN: 1905 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HEALTHY HOUSING SEMINAR.

A two and a half hour consumer Healthy Housing seminar, with a renovation focus, has been developed and packaged for delivery. The material was based on existing material produced by the CMHC Ontario and British Columbia Regional offices. It was also updated to include recent research and to give it a national scope. Examples of case studies were included by incorporating material from the 1994 and 1996 Renovation Demonstration projects. CMHC has entered into a partnership with the building supply industry for delivery of these seminars. Presenters will consist of both private presenters and the training staff of our retail partners. The seminars will be held across Canada, however the actual locations and timing are being negotiated with the project partners. It is anticipated that the seminars will have a limited run in some locations this spring, continue again in the fall and then run again in the spring of 1999.

A condensed 30-minute presentation of the Healthy Housing Seminar was also produced. This material can be used at home builder association meetings, various industry shows and conferences and also in the preparation of background documents.

CMHC Project Officer: Darrel Smith

CIDN: 1906 0200001

Division: Research Division

STATUS: Ongoing Project

MICROCLIMATIC OPTIMIZATION OF THE NORTHERN SUBURBS IN RELATION TO THE WIND.

The research project essentially concerns the study of wind behaviour in the suburbs at the street and parcel space levels.

CMHC Project Officer: Chris Ives, Research Division

CIDN: 1840 0200001

AVAILABILITY: Publication not yet available

STATUS: Ongoing Project

MULTIFAMILY HOUSING FOR COMMUNITY SUSTAINABILITY.

This project will produce information to assist developers and municipalities in developing land at higher than current average densities by means of multiple housing forms. It will assemble and develop exemplary multiple housing solutions and assess consumer demand for these. This is a collaborative project with the Regional Municipality of Ottawa Carleton and NRCan both of which have a strong interest in community sustainability.

CMHC Project Officer: Fanis Grammenos, Research Division

CIDN: 1628 0300001

AVAILABILITY: Publication not yet available

STATUS: Ongoing Project

PLANNING SUSTAINABLE COMMUNITIES.

The purpose of this project is to develop an updated advisory document on community planning and design. The updated document is intended to be a state-of-the-art report, reflecting the latest thinking in the field. The emphasis of the document will be on presenting practical examples (best practices and case studies) of innovative, sustainable and cost-effective approaches to community planning and design. It is anticipated to be available by summer 1998.

CMHC Project Officer: David D'Amour, Research Division

CIDN: 1553 0200001

AVAILABILITY: Publication not yet available

STATUS: Ongoing Project

PROTOTYPE OF THE COMMUNITY SUSTAINABILITY INDICATORS SOFTWARE.

The purpose of this project is to develop and provide a working prototype of the Community Sustainability Indicators Software which will include a working demonstration of all the elements of the software concept.

CMHC Project Officer: John Engeland, Research Division

CIDN: 1796 0200002

AVAILABILITY: Publication not yet available

STATUS: Ongoing Project * NEW *

STRATEGY FOR THE DEVELOPMENT, MARKETING AND DISTRIBUTING OF CONSUMER-ORIENTED PRODUCTS ON SUSTAINABLE COMMUNITY PLANNING.

To prepare a strategy for the development (i.e. content and format), marketing and distribution of consumer-oriented information products which would provide consumers with information on resource-use, costs and social implications of various community planning options in order to make decisions which benefit themselves and society.

CMHC Project Officer: Susan Fisher, Research Division

CIDN: 1945 0200001

AVAILABILITY: Publication not yet available

STATUS: Ongoing Project * NEW *

SUSTAINABILITY IN PRACTICE: REDUCING CONSTRUCTION WASTE IN THE ONTARIO RESIDENTIAL CONSTRUCTION INDUSTRY

One of the major challenges facing all advocates of sustainable development is putting theory into practice. The sound management of construction waste is one of many factors related to sustainable development that must be addressed by the housing industry. The objective of this project was to identify the most effective strategies for minimizing residential construction waste in Ontario. This involved looking at work already done on the subject, as well as interviewing several builders on their waste management practices. As a result of a collaboration between a consulting firm, Habitat Associates, and the Ontario Home Builders' Association (OHBA), regulatory mechanisms were downplayed in favour of identifying *voluntary* ways to cut waste, and earmarking ways to effectively *implement* a strategy to assist home builders with minimizing waste.

The study was conducted in two phases. Phase 1 analyzed construction waste management practices in Ontario, including waste generation rates, trends and individual reduction initiatives. Key considerations for implementing a waste reduction strategy for Ontario were identified, and in Phase 2 an implementation strategy to be led by the OHBA was developed.

Several conclusions were drawn from the first phase of the study, but two emerged as key to addressing the objectives, i.e. facilitating voluntary acceptance of waste minimizing practices and enhancing the reach and impact of the message. First, minimizing construction waste generation should be emphasized over separation and recycling. Reduction is typically the preferred of the 3Rs, but besides being the most effective way of minimizing waste, it has the potential to save money. This message is capable of attracting attention, encouraging serious consideration, and permanently changing practices. Reducing materials consumption also has a truly positive environmental impact. Secondly, builders' practices are very diverse, suggesting that there is considerable opportunity to increase awareness about waste avoidance techniques. Effectively reaching all those with a role to play in reducing waste is not easy, and therefore will require effort. Significantly reducing waste will involve improving awareness of both the general benefits of waste reduction as well as specific techniques that can reduce waste.

The second phase of the project was devoted to developing an outreach program. Based on the conclusions of Phase 1, five potential outreach strategies were formulated. Builders and others were asked to comment on the effectiveness of each alternative strategy. Based on builders' feedback and the experience and resources of the OHBA, a grassroots strategy to assist Ontario builders to reduce waste was selected. Two products were generated. The first is a kit designed to assist local Home Builders' Associations (HBAs) with initiating a local campaign or event to raise awareness of the benefits of waste reduction. The second document provides details that can be used as background information by those hosting an event, and can also be used directly by home builders. It contains practical information, testimonials and cost-saving data.

Prepared by Teresa Paul, Habitat Associates with the Ontario Home Builders' Association. CMHC Project Officer: Terry Marshall. Ottawa: Canada Mortgage and Housing Corporation, 1997 (External Research Program).

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

SUSTAINABLE LANDSCAPE DESIGN FOR RESIDENTIAL DEVELOPMENTS.

The objective of this project is to highlight the link between sustainable development for housing with the condition, composition and use of native vegetation.

CMHC Project Officer: Susan Fisher

CIDN: 1466 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Karen Vagelatos, Vagelatos Associates Landscape Architecture Ltd.
207-2211 West 4th Avenue
Vancouver, British Columbia, V6K 4S2

AVAILABILITY: Publication not yet available

VISUALIZING SUSTAINABILITY: ANALYZING PREFERENCES FOR SUSTAINABLE COMMUNITY DESIGN.

The scope of this research is to provide a visual forum for the exploration of sustainable community design on the Internet. The purposes of the forum are to educate the public and to provide a vehicle for the free and open exchange of ideas.

CMHC Project Officer: Fanis Grammenos

CIDN: 1640 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Professor Richard Perron, Department of Landscape Architecture
University of Manitoba
Winnipeg, Manitoba, R3T 2N2

TREE CARE

TIPS FOR POST-STORM TREE CARE.

This fact sheet on post-storm tree care was prepared in response to the recent ice storm in Eastern Ontario and Quebec. Tips are provided on how to clean up broken branches and remove torn bark, how to maintain tree vigour, and how to hire a contractor. Sources of further information are included.

About Your House Fact Sheet; CE 12. Ottawa: Canada Mortgage and Housing Corporation, 1998.

STATUS: Completed

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NOTE : Aussi disponible en français sous le titre : *Le soin des arbres après la tempête.*

APPLICATION FOR SHOWER WASTE WATER HEAT RECOVERY.

The purpose of this project is to test the performance of a heat recovery shower product.

CMHC Project Officer: Chris Ives

CIDN: 1500 0200001

Division: Research Division, Housing Technology Incentives Program

STATUS: Ongoing Project

Grant Recipient: Heat Exchangers NF Incorporated
26 Georgia Drive
Stephenville, Newfoundland, A2N 2T5

AVAILABILITY: Publication not yet available

DISCUSSION PAPER ON WATER REUSE - NEEDS, TRENDS AND CASE STUDIES.

This project will serve as a basis for discussion with agencies involved with water infrastructure, research groups, potential manufacturers of water technologies, and the general public. The research will identify water technologies, discuss performance through case studies, and highlight areas in Canada that are in need of such technologies.

CMHC Project Officer: Cate Soroczan

CIDN: 1927 0200003-4

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

GREYWATER TECHNOLOGY SOFTWARE DEVELOPMENT.

CMHC is participating in this research project to further develop the TECHSPEX software package to address water use, reuse and treatment. This product will provide a number of technical solutions to onsite or small community water treatment requirements based on user needs. Costs for the items specified and product availability are also included in the software development.

CMHC Project Officer: Cate Soroczan

CIDN: 1927 0200005

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INNOVATIVE ON-SITE WASTEWATER TREATMENT.

This project is studying the impact of residential water conservation and on-site wastewater management on groundwater quality. In particular, it addresses the issue of nitrates in groundwater. The test site is a new, occupied rental unit which contains code-approved water-conserving fixtures coupled to a novel on-site wastewater treatment system. A monitoring program is in place to determine the impact of the reduced waterflow on the baseline ground water quality. The initial loading conditions for this single house system have been adequately demonstrated and some changes have been made to the installation to increase the recycling level of effluent to the Biofilter. The final report is currently in the review stage with an anticipated completion date in early summer 1998.

CMHC Project Officer: Chris Ives

CIDN: 1047 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INNOVATIVE RESIDENTIAL WATER AND WASTEWATER TECHNOLOGIES.

The purpose of this project is to identify and describe applications and research on innovative technologies for residential water supply and wastewater treatment.

CMHC Project Officer: Peter Russell

CIDN: 1832 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

A NEW PROCEDURE FOR EVALUATING THE PERFORMANCE OF ON-SITE SYSTEMS.

To assess the value of the "Leachfield Evaluation Test", claimed to be successfully used by agencies in California. This is a method for assessing the hydraulic performance of an onsite sewage disposal system.

CMHC Project Officer: Chris Ives

CIDN: 1289 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: D.H. Waller, Technical University of Nova Scotia
Centre for Water Resources Studies
1360 Barrington Street, P.O. Box 1000
Halifax, Nova Scotia, B3J 2X4

AVAILABILITY: Publication not yet available

ON-SITE RECYCLED WATER QUALITY MONITORING.

This project will identify the available water quality monitoring technologies appropriate for on-site and small community reuse and treatment systems. The study will also examine issues of merit, cost of implementation and operational factors.

CMHC Project Officer: Cate Soroczan

CIDN: 1936 0200

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

REGULATORY BARRIERS TO ON-SITE WATER REUSE.

This report represents the results of an investigation into the existence of regulatory barriers to the implementation of on-site water reuse in Canada. The report explores the barriers which are present in health and environmental regulations, as well as in plumbing/building codes and municipal by-laws. Regulatory barriers are outlined at the national level and within each province or territory, with municipal examples provided.

The results of the report indicate that the most significant barrier to the implementation of on-site water reuse may be the lack of regulations and guidance across the country. Proponents indicated that guidance within provisions of the Plumbing Code would facilitate the acceptance of on-site reuse technology within their jurisdictions. In particular, documented proof of the safety of on-site systems with regard to public health would be of great benefit. No absolute regulatory barriers to on-site water reuse could be identified. Obstacles are instead created largely by attitudes and perception. The solution may lie in creating a Code of Good Practice and documenting case studies in order to provide guidance and confidence to decision-makers.

Prepared by Canadian Water and Wastewater Association. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Cate Soroczan. Ottawa: CMHC, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642, Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NOTE : Aussi disponible en français sous le titre : *Obstacles posés par la réglementation à la réutilisation de l'eau locale.*

REPORT ON WATER AND WASTE WORKSHOP.

Provide a detailed report on a Workshop held at CMHC Oct. 22 on "Accelerating the Implementation of Innovative Water and Wastewater Treatment Management and Technology".

CMHC Project Officer: Peter Russell

CIDN: 1757 0300002

Division: Research Division

STATUS: Ongoing Project

Grant Recipient: Mr. Allan Townshend
R.R.# 1
Athens, Ontario, K0E 1B0

THE SUSTAINABLE HOME WATER SYSTEM.

The objective of this research is to develop a system which will collect rain water for non-potable uses in a house plus a grey water heat recovery and recycling system.

CMHC Project Officer: Peter Russell

CIDN: 1224 0200001

Division: Research Division, Housing Technology Incentives Program

STATUS: Ongoing Project

Grant Recipient: A.C.E. Alternative and Conservation Energies Inc.
1909-10th Avenue S.W.
Calgary, Alberta, T3C 0K3

AVAILABILITY: Publication not yet available

WATER RECYCLING DEMONSTRATION.

Research and development of greywater reuse is being undertaken in the Conservation Co-op apartment building in Ottawa. A facility in the basement filters and disinfects shower and bath water from 8 units which is reused as toilet flushing water. Initial design and component shortcomings have been corrected and the system is operational with hand-over to the building owners anticipated at the end of 1998. Plant performance and water quality are being measured with a report anticipated towards the end of 1998.

CMHC Project Officer: Peter Russell

CIDN: 1573 02010003,
1573 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

WATER RECYCLING DEMONSTRATION AT THE QUAYSIDE VILLAGE COHOUSING DEVELOPMENT IN NORTH VANCOUVER.

The objective of this project is to demonstrate a water reclamation system suitable for installation in Quayside Village. The installation will be designed to collect water discharged from the bath, sinks and showers in the 19 units for re-use as toilet flushing and shower use in the same units.

CMHC Project Officer: Cate Soroczan

CIDN: 1991 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

WATER CONSERVATION, REUSE & MANAGEMENT

WATERSAVE : RESIDENTIAL WATER USE MODEL.

A user-friendly computer model was developed that determines daily water consumption for a prescribed pattern of water use in a house. It also incorporates facilities to treat and reuse grey water. The program will be of value to designers of innovative residential plumbing systems. Its first applications were for the design of the water system for the CMHC Toronto Healthy House and the Conservation Co-op apartment building in Ottawa (see "Water Recycling Demonstration"). Version I will be released by summer 1998.

CMHC Project Officer: Peter Russell

CIDN: 1422 0200002,
1422 0800001

Division: Research Division, Panel on Energy Research & Development

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SOCIAL AND ECONOMIC RESEARCH

BRINGING THE HABITAT AGENDA HOME.

The purpose of this project is to publish a book to inform the membership and others in the Canadian Habitat NGO network about the outcome of the Habitat II Conference and the Habitat Agenda, as well as to provide information and ideas in order to facilitate the implementation of the Habitat Agenda.

CMHC Project Officer: Louis Musto

CIDN: 1965 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

EVALUATION OF THE *ÉCO-QUARTIERS* PROGRAM.

The purpose of this project is to evaluate Montréal's *Éco-quartiers* program with regard to the management of the urban environment and the improvement of the living environment.

CMHC Project Officer: Susan Fisher

CIDN: 2001 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Gilles Sénécal, INRS-Urbanisation
3465 Durocher Street
Montréal, Quebec H2X 2C6

*** NEW ***

AVAILABILITY: Publication not yet available

CONTAMINATED LANDS

URBAN BROWNFIELDS: CASE STUDIES FOR SUSTAINABLE ECONOMIC DEVELOPMENT: THE CANADIAN EXAMPLE.

This paper is part of the contribution of CMHC to an ongoing collaborative initiative of the Organization for Economic Cooperation and Development (OECD), the United States Environmental Protection Agency (U.S. EPA), and the International City and County Managers Association (ICMA). The report provides information on the current Canadian situation regarding legal and administrative frameworks, players in the process of developing contaminated sites, recent case studies, and suggested best practices that might be employed in other jurisdictions.

Challenges to development on contaminated sites are grouped into six issue groups: regulatory, technical/scientific, legal/liability, financial, urban planning, and communications. By far the most prominent issue is the desire of all participants in the development process to reduce or eliminate their exposure to liability to pay for site cleanup or the effects of contamination. A significant issue is the added time and expense that is required to develop contaminated sites that may result from approval processes, and regulations which call for unnecessary or unrealistic cleanup activities. The inability to gain financing and insurance for redevelopment projects is a significant barrier. There are opportunities for a better integration of land use planning and site remediation disciplines and their respective approval processes. Methods to better communicate the issues surrounding contaminated sites are needed to reduce fears and misconceptions among process participants and observers alike.

To address the many issues common to redeveloping contaminated sites, twenty-two best practices are suggested. The single most important best practice is the risk assessment/risk management (RA/RM) approach. This method evaluates the actual human or environmental risk, considering the nature of contaminants in relation to the sensitivity of receptors and the exposure pathways, and is favoured by many practitioners.

Prepared by Delcan Corporation, Golder Associates Ltd., and McCarthy-Tétrault. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Manager: David D'Amour. Ottawa: CMHC, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

COOPERATIVE AND NON-PROFIT HOUSING

MEMBER INTEGRATION - MANAGEMENT PRACTICES IN HOUSING COOPERATIVES

The research project aims to study the integration and housing processes within the management practices in cooperative housing environments.

CMHC Project Officer: Glynis Kossatz

CIDN: 1451 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Marie J. Bouchard

Université du Québec à Montréal
P.O. Box 6192, Station CV
Montréal, Quebec H3C 4R2

AVAILABILITY: Publication not yet available

DISCRIMINATION IN HOUSING

HOUSING AND DISCRIMINATION: A REVIEW OF CURRENT KNOWLEDGE.

The objective of this research is to identify and examine what knowledge and expertise regarding housing-related discrimination is available in or applicable to Canada.

CMHC Project Officer: Teresa Van Den Boogaard

CIDN: 1792 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

HOUSING AND DISCRIMINATION: THE LEGAL FRAMEWORK.

The purpose of this project is to examine housing-related discrimination from a legal perspective to understand how housing-related discrimination fits in Canada's legal framework.

CMHC Project Officer: Teresa Van Den Boogaard

CIDN: 1793 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOME OWNERSHIP

HOMEBUYING STEP BY STEP: A CONSUMER GUIDE AND WORKBOOK.

This hands-on workbook provides users with everything they need to purchase a home. It covers all the steps in the process, from assessing housing needs to arranging a mortgage and closing the deal. Checklists and worksheets are provided to help in assembling the right information and make the right decisions and a glossary of homebuying terms is included.

Ottawa: Canada Mortgage and Housing Corporation, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642, Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

IDENTIFYING THE IMPEDIMENTS TO BUYING A HOUSE.

The purpose of this project is to conduct a survey of people searching for houses in order to improve understanding of home buyer behaviour. The survey will ask questions about the duration of time already spent searching; the number of houses inspected without selecting one of them; ... etc.

CMHC Project Officer: David Dallaire

CIDN: 1650 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Dr. Paul Anglin, Associate Professor
University of Windsor, Department of Economics
401 Sunset Avenue
Windsor, Ontario, N9B 3P4

AVAILABILITY: Publication not yet available

METHODS USED ABROAD TO SUPPORT ACCESS TO HOME OWNERSHIP.

The objective of this research is to investigate significant and novel mechanisms which other nations have employed, encouraged and/or are considering that support and facilitate access to home ownership in general or to target populations.

CMHC Project Officer: David Metzak

CIDN: 1931 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

HOMELESSNESS

THE BEST PRACTICES FORUM ADDRESSING HOMELESSNESS.

The objective is to prepare a forum structure and implementation plan for the Best Practices Forum Addressing Homelessness.

CMHC Project Officer: Brenda Baxter

CIDN: 1958 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

HOUSING

LINKS BETWEEN HOUSING AND THE HEALTH OF THE POPULATION.

The objective of this project is to study the links between housing and population health.

CMHC Project Officer: Phil Deacon

CIDN: 1926 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

RESIDENTIAL PROJECTS AND ROAD SAFETY.

To make an inventory of the proposed residential development principles in view of ensuring the safety of the different road users and the quality of life of the residents.

CMHC Project Officer: Leigh Howell

CIDN: 0925 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Denise Piché, Université Laval, School of Architecture
Québec, Québec G1K 7P4

AVAILABILITY: Publication not yet available

HOUSING

"WHO DOES WHAT" IN THE CANADIAN HOUSING SYSTEM.

The objective of this project is to identify the roles and responsibilities of the three levels of government with respect to housing.

CMHC Project Officer: Jamie Angus

CIDN: 1895 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSING AFFORDABILITY

"AFFORDABLE PROJECT OF THE MONTH" WEB PAGE.

This project will determine the feasibility, content and method of maintaining a monthly page on the CMHC web site that portrays successful, affordable housing projects. It will examine the interests of the development community with regard to information on affordability, generate a structure and format that responds to these needs and create an initial database of appropriate projects that could be posted. The Web page is expected to be operational by mid 1998.

CMHC Project Officer: Fanis Grammenos

CIDN: 1878 0200001

Division: Research Division

STATUS: Ongoing Project

AFFORDABLE, VERSATILE HOUSING.

This project will identify and describe house designs that enable a house to accommodate a range of housing types, sizes and needs by means of their adaptability. It will document the features of designs that have been built and it will explain their economic and use advantages. The set of designs to be included will cover all housing forms, from detached houses to apartments. This first guide on adaptable designs will be made available both in hard copy and electronic format via the Internet. The final report will be available in August 1998.

CMHC Project Officer: Fanis Grammenos

CIDN: 1783 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSING AFFORDABILITY

BLENDING INCOME HOUSING: LITERATURE REVIEW AND ANALYSIS.

The purpose of this project is to provide a summary of the range of housing, social and economic issues and thinking on income blended housing projects and the evolution of experiences within it.

CMHC Project Officer: David Scherlowski

CIDN: 1925 0200001

iDivision: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

MARKET ANALYSIS AFFORDABILITY SOFTWARE PROJECT.

The objective of this project is to make modifications to Affordability to keep the software current with the latest technology; provide customization for interested clients/partners; create a fully functional Internet version should it be feasible; and provide technical support and expertise to help solve issues and problems that cannot be resolved by CMHC's help desk.

CMHC Project Officer: Greg Goy

CIDN: 1536 1000002

iDivision: Market Analysis Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

HOUSING AFFORDABILITY

NEW WAYS TO CREATE AFFORDABLE HOUSING: RESULTS OF A NATIONAL SURVEY OF HOUSING PROVIDERS - FINAL REPORT

The Canadian Housing and Renewal Association (CHRA) and Canada Mortgage and Housing Corporation (CMHC) entered into a partnership arrangement in 1997 to investigate activities being undertaken by the non-profit, municipal and co-operative housing sector to develop affordable housing without traditional government housing supply programs. A survey was undertaken to identify:

- the level of interest, capacity and willingness of these groups to develop affordable housing;
- innovative approaches that have been used, attempted or considered;
- tools, mechanisms and information that may be needed to implement innovative approaches; and
- interest in creating a system to facilitate the ongoing sharing of information on "best practices" and the preferred format and medium.

A total of 186 organizations responded to the survey. Most of the respondents were traditional housing providers, community based non-profit housing groups, other non-profits and municipal non-profit groups. Although not a random survey, and therefore not representative of the entire population of housing organizations, the results are indicative of the nature of current affordable housing activity across the country, and do provide insights into the views of housing providers on a range of relevant issues.

Prepared by Deborah Kraus and Margaret Eberle. Sponsored by the Canadian Housing and Renewal Association and Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

PREPARATION OF A GUIDE TO HOUSING PARTNERSHIPS.

The purpose of this project is to prepare the substantive content of a guide to creating housing partnerships in Canada.

CMHC Project Officer: Jamie Angus

CIDN: 1874 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSING AFFORDABILITY

THE PROVISION OF AFFORDABLE HOUSING IN THE UNITED STATES THROUGH PUBLIC-PRIVATE PARTNERSHIPS (PPPs)

The objective of this project is to prepare a report outlining how the US has developed and evolved an apparent "system-wide" approach to encouraging and supporting the provision of affordable housing through PPPs and to assess whether there are opportunities to either adopt and/or adapt similar types of measures in Canada.

CMHC Project Officer: David Metzak

CIDN: 1790 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SHELTER AFFORDABILITY AND HOUSING NEEDS OF CANADIAN FOOD BANK CLIENTS

The purpose of this research is to encourage an exchange of information on the substantive aspects of the project, Shelter Affordability and Housing Needs of Canadian Food Bank Clients.

CMHC Project Officer: John Engeland

CIDN: 1099 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Jeff A. Sloan, c/o Associate Professor, University of Manitoba
Nursing Research Institute, Faculty of Nursing
Winnipeg, Manitoba, R3T 2N2

AVAILABILITY: Publication not yet available

HOUSING AND IMMIGRATION

A COMPARATIVE STUDY OF IMMIGRANT HOUSING, NEIGHBOURHOODS AND SOCIAL NETWORKS IN TORONTO AND MONTREAL.

This study examines the relationships that exist between housing, neighbourhoods and social networks among visible minority immigrants living in metropolitan Toronto and Montreal. The importance of comparative research between cities and immigrant groups in order to dismantle the ideas of a singular "immigrant experience" is emphasized, as is the importance of intra-urban housing and neighbourhood-based processes within our largest cities in understanding the nature of settlement. The study focuses on Jamaican, Central American and Vietnamese immigrants living in Toronto, and the same groups, substituting Haitians for Jamaican immigrants, in Montréal. The objectives of the study are five-fold: 1) to examine where individual immigrant groups live in Toronto and Montreal and their degree of segregation; 2) to survey differences in housing conditions (tenure, dwelling type, cost, quality) between visible minority groups and to investigate factors which may account for such differentials; 3) to test the hypothesis that vertical immigrant enclaves in high-and low-rise buildings are replacing older inner city neighbourhoods as reception areas for immigrants; 4) to compare and contrast the housing experiences, residential satisfaction, perceptions of the city and neighbourhoods, and types of neighbouring between different immigrant groups; and 5) to probe the development of community through an examination of the ways in which immigrants have developed, use and gain support from social networks of kin and friends. The study draws upon two data sources: the 1991 Canadian census and a questionnaire survey of 173 individuals. Among the study's major findings are: significant suburbanization of some immigrant groups in a variety of styles of housing with important variations between the two cities; somewhat poorer housing conditions for immigrants relative to British/French Canadians and that these differences in status are not simply a function of time of arrival, household income or family type; generally strong levels of satisfaction with housing and neighbourhoods among individuals in both cities; and the critical roles played by friends and family in facilitating post-arrival settlement over a period of years.

Prepared by Brian K. Ray. CMHC Project Officer: Roger Lewis. Ottawa: Canada Mortgage and Housing Corporation, 1998. (External Research Program).

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642, Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

GUIDE TO CANADIAN HOUSING FOR IMMIGRANTS.

The purpose of this project is to produce a guide that would assist immigrants in understanding Canadian housing and housing systems.

CMHC Project Officer: Jamie Angus

CIDN: 1802 0200001

Division: Research Division

STATUS: Ongoing Project

Grant Recipient: Mr. Tom Zizys, Ph. D.

56 Blantyre Avenue, Scarborough, Ontario, M1N 2R4

AVAILABILITY: Publication not yet available

HOUSING EXPORT OPPORTUNITIES

ADAPTING CANADIAN HOUSING TO INTERNATIONAL MARKET REQUIREMENTS.

The objectives of this project are to develop a qualitative and quantitative presentation on the extent of off-the-shelf versus adapted offerings of industry at present; develop a sector-by-sector picture of the feasibility of adaptation, based on considerations to be taken into account in each, and on specific case studies; and, develop a ranked list of practical steps which can be taken by Canadian industry to adapt to foreign customer requirements and expectations.

CMHC Project Officer: Rob Duncan

CIDN: 2008 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: David Crenna
82 Bayswater Avenue
Ottawa, Ontario, K1Y 2E9

AVAILABILITY: Publication not yet available

* NEW *

CANADIAN/JAPANESE CONSTRUCTION COST ANALYSIS OF A TYPICAL 2X4 FRAMED HOUSE PLAN.

The purpose of this project is to develop a costing spreadsheet tool for use on all soft and hard costs forming part of the delivered turn key project including at minimum, design; permits and approvals; materials; etc.

CMHC Project Officer: Jay Thakar

CIDN: 1596 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CODES AND STANDARDS PROPOSAL TO GERMANY.

The objective is to develop and implement a strategy and action plan for a proposal to be made to German authorities to improve access to the German housing market for the Canadian Housing System.

CMHC Project Officer: Terry Robinson

CIDN: 1809 0900001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSING EXPORT OPPORTUNITIES

CRITERIA TO HELP FORGE SUCCESSFUL CANADIAN HOUSING ALLIANCES.

The purpose of this project is to develop and validate criteria to help determine what makes alliances successful in the housing export market.

CMHC Project Officer: Louis Musto

CIDN: 1770 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

DIRECTORY OF SOURCES OF SUPPORT FOR CANADA'S HOUSING EXPORTERS. THIRD EDITION.

The purpose of this directory is to summarize federal, provincial and other Canadian programs and services currently available to support the international commercial endeavours of Canada's housing industry.

Most of the resources identified are provided through federal departments and agencies and are related mainly to such areas as export promotion, financing, preparedness, training, market research, insurance and the provision of market intelligence and data. Additional export resources include those provided by provincial agencies responsible for export promotion and expansion, the international trade expertise that resides in Canada's academic community, in private or non-profit sector organizations focused on expanding Canadian exports, and non-governmental trade organizations.

Ottawa: Canadian Housing Export Centre, Canada Mortgage and Housing Corporation, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NOTE : Aussi disponible en français sous le titre : *Répertoire des sources offrant un soutien aux exportateurs canadiens du secteur de l'habitation.*

HOUSING EXPORT OPPORTUNITIES

EXPANDING THE KOREAN MARKET FOR RESIDENTIAL WOOD-FRAME CONSTRUCTION: FINAL REPORT.

This report summarizes a study of regulatory and other impediments to the potential expansion of the South Korean market for Canadian-style wood-frame construction for multiple unit residential buildings. The overall goal of the study was to identify means of eventually increasing sales of Canadian wood-frame residential construction materials, equipment and professional services in South Korea.

The authors provide an overview of the housing market and summarize South Korean building code requirements which affect multiple unit residential construction and limit the use of wood structures. They discuss the activities of the South Korean housing industry in respect of wood-frame construction, as well as perceptions of a variety of South Korean sources regarding the possible expansion of the wood-frame construction market. Strategic considerations respecting this potential expansion of market are also identified.

Prepared by Larden Muniak Consulting Inc. in association with Sang-Man Youn Architect. CMHC Project Officer: Jay Thakar. Ottawa: Canada Mortgage and Housing Corporation, Canadian Housing Export Centre 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

EXPORT HOME SEISMIC SLAB FOUNDATION.

The purpose of this project is to identify and develop a new seismic resistive foundation system for use in Japan, which could be "packaged" with Canada's housing technology and exports to create a value-added and thus more attractive export housing product.

CMHC Project Officer: Rob Duncan

CIDN: 2019 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Ian B. Bazley

*** NEW ***

32 Bello Road

Kelowna, British Columbia V1V 1C1

AVAILABILITY: Publication not yet available

HOUSING EXPORT OPPORTUNITIES

EXPORTER WORKSHOP FOR CANADA'S HOUSING INDUSTRY.

Prepare and deliver a series of workshops aimed at providing hands-on training for housing industry small and medium enterprise principals who want to begin exporting or would like to improve their export related knowledge and basic exporting skills.

CMHC Project Officer: Louis Musto

CIDN: 1768 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INTERNATIONAL COMPETITION IN CHINA'S HOUSING MARKET.

Provide Canadian housing companies with up-to-date knowledge of the types of housing and prices offered by foreign competitors in China's housing market.

CMHC Project Officer: Jay Thakar

CIDN: 1772 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INTERNATIONALIZATION OF CANADIAN HOUSING SECTOR BUSINESSES: A PERCEPTUAL ANALYSIS

The objective of this project is to conduct directed interviews with forty business executives throughout the country, working in three sub-sectors of the housing industry: professional construction services, housing manufacturers and product and material makers.

CMHC Project Officer: Joanne Hallée

CIDN: 1999 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: François Cadotte, FC Recherche

2238 Belgrave Avenue

Montreal, Québec H4A 2L8

*** NEW ***

AVAILABILITY: Publication not yet available

HOUSING EXPORT OPPORTUNITIES

RETROFITTING RUSSIA'S HOUSING STOCK: OPPORTUNITIES AND OBSTACLES FOR CANADIAN EXPORTERS.

To identify several basic business development strategies which could be employed by Canadian firms to practically and realistically respond to the market opportunities represented by the Russian housing sector.

CMHC Project Officer: Oliver Drerup

CIDN: 1830 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Green Catalyst Group Inc.
153 Huron Street
Toronto, Ontario, M5T 2B6

AVAILABILITY: Publication not yet available

SECONDARY RESEARCH ON THE CANADIAN HOUSING INDUSTRY.

The purpose of this project is to construct profiles of selected sub-sectors that comprise the Canadian Housing Export Centre's major target client base.

CMHC Project Officer: Louis Musto

CIDN: 2035 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSING MARKET

EMPLOYMENT AND HOUSING ACTIVITY: A CYCLICAL ANALYSIS.

The objective of this project is to review the economic literature, prepare an estimation strategy, analyze the past cycles of retained employment indicators and estimate the elasticities of housing starts and MLS sales in relation to the employment indicators.

CMHC Project Officer: Louis Trottier

CIDN: 1952 1000002

Division: Market Analysis Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

MACROECONOMIC IMPACTS OF THE HOUSING SECTOR.

This study presents a series of simulations investigating the macroeconomic impacts of a two-year, temporary increase in housing construction activity. The simulations were conducted with the FOCUS macroeconometric model, built and maintained at the Institute for Policy Analysis, University of Toronto.

The central section of the study presents simulation results for 16 separate simulations. These simulations consider all the possible combinations of four basic two-way choices or assumptions: new construction versus alterations, high versus low growth in the underlying economy, historically observed versus observed-times-two import propensities in the construction sector, and monetary policy aimed at stabilizing interest rates versus monetary policy aimed at stabilizing exchange rates.

The simulations show that a temporary increase in housing activity can have important induced effects on the economy, and that stimulus of this sort could be used as a tool of countercyclical policy during a slump or recession. Stimulus takes up to a year to gather momentum and can persist for a year or more after the stimulus is removed. The simulations also indicate that a temporary housing stimulus of this kind develops its own contractionary aftershock within 3 to 4 years (or somewhat longer under interest-rate targeting).

The simulations indicate small differences in impacts when new construction is compared to alterations. Doubling import propensities in construction naturally scales down the expansionary impact of construction activity, since expenditure leakages in the form of imported building materials are greater. The choice of interest rate and exchange rate control has little effect on the short-term impacts of the cases, but do produce more pronounced differences over the longer term. Assumptions about the state of the economy have little impact on the simulation results.

Prepared by Informetrica Limited. Analysis and Simulations: Geoff Bromfield; Report: Carl Sonnen. CMHC Project Officer: Orlando Manti. Prepared for Research Division, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642, Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

HOUSING POLICY

SUMMARY OF THE 1998-2002 CORPORATE PLAN = RÉSUMÉ DU PLAN D'ENTREPRISE POUR 1998-2002.

This document provides a summary of Canada Mortgage and Housing Corporation's (CMHC) Corporate Plan for the 1998-2002 period and the Corporation's 1998 annual budgets which were approved by the Treasury Board and the Governor in Council in December 1997. This summary, a requirement under the *Financial Administration Act (FAA)*, is tabled each year in Parliament.

The Corporate Plan Summary identifies key issues that will impact on CMHC's business directions over the next five years, the overall objectives for the planning period, the strategies and associated activities that CMHC will use to achieve its objectives, and the performance measures for the strategies. The document also sets out a plan for the financial resources that CMHC will require to carry out federal housing policy for the next five years.

Ottawa: *Canada Mortgage and Housing Corporation, 1998.*

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

HOUSING SURVEYS

FEASIBILITY STUDY FOR A SURVEY OF CONSUMER INTENTIONS TO BUY OR RENOVATE.

Canada Mortgage and Housing Corporation (CMHC) client surveys have identified the need to increase the quality and timeliness of information about the intentions to purchase a home or to undertake renovations. A consumer intentions survey could provide CMHC and its clientele with a short-term indicator of local housing activity, and give important insights into the following questions:

- Are there differences between the purchase intentions of first-time and repeat buyers?
- What size of home are purchasers looking for? How much are they looking to spend?
- Why are people choosing to buy or renovate? Why are people *not* choosing to buy or renovate? Are decisions related to the economic conditions, or lifestyle choices and preferences?

This research looks at the feasibility and cost for a survey instrument that addresses these key issues and objectives.

The study involved two components: 1) an analysis of the literature on the relationships among consumer intentions, confidence, and purchase activity, and 2) the design and pre-test of a questionnaire as the basis for determining the feasibility of a program to track consumer intentions with respect to housing. The literature review provided the theoretical and conceptual context for the pre-test instrument; the pre-test itself provided information about the costs and effectiveness of the proposed instrument.

After reviewing a series of methodological options, the authors conclude that a telephone survey represents the most cost effective way for CMHC to undertake a study of housing intentions. The methodology is akin to that used in the University of Michigan Survey Research Centre on its Index of Consumer Sentiment. They have proposed a sample questionnaire (Appendix A) that has already been pre-tested for question phrasing and flow. The questionnaire collects a range of information about respondents' housing intentions and the reasons for these intentions.

Large sample sizes will be needed to generate statistically valid information for the sample groups that CMHC has identified. This raises the cost of the study accordingly. However, the quality of information generated is also much improved. Factors such as the precision, frequency, and resolution of the survey must be weighed in determining business feasibility.

Prepared by Prairie Research Associates. Prepared for Market Analysis Centre, Canada Mortgage and Housing Corporation. CMHC Project Managers: Greg Goy, Terry Petherick, Tim Gross, Ali Manouchehri. Ottawa: CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NOTE : Aussi disponible en français sous le titre : *Étude de faisabilité pour une enquête sur les intentions d'achat ou de rénovation des consommateurs.*

HOUSING SURVEYS

REVIEW OF DATA SOURCES AND INDICATORS.

The purpose of this project is to undertake a review of the major national data sources that include housing information which will assist in examining the role each might play in monitoring housing and community trends and developing related indicators.

CMHC Project Officer: Roger Lewis

CIDN: 1988 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

SEASONAL ADJUSTMENT OF HOUSING STARTS TIME SERIES.

The objective of this project is to introduce reliable estimates of seasonally adjusted series at the beginning of the new year, at the time when all other CMHC survey data are revised and updated.

CMHC Project Officer: Michel Laurence

CIDN: 1967 1000002

Division: Market Analysis Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

INFRASTRUCTURE

PRIVATIZATION OF MUNICIPAL INFRASTRUCTURE, ANALYZING THE COSTS AND BENEFITS.

The objective of this research is to conduct a comprehensive literature review to obtain an understanding of the past and present privatization efforts and issues.

CMHC Project Officer: David D'Amour

CIDN: 1788 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INFRASTRUCTURE

THE PROVISION OF MUNICIPAL INFRASTRUCTURE THROUGH DEMAND MANAGEMENT.

The purpose of this project is to prepare a guide or advisory document on demand management strategies for municipal water and wastewater services.

CMHC Project Officer: David D'Amour

CIDN: 1916 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

MORTGAGES AND HOUSING FINANCE

FEASIBILITY STUDY ON THE COMMERCIAL VIABILITY OF LAND-ONLY MORTGAGE LOAN INSURANCE.

To enable CMHC to better assess the potential demand for land-only mortgage loan insurance, the risks associated with offering land-only mortgage loan insurance and what means would be available to CMHC to mitigate those risks is being investigated.

CMHC Project Officer: Brian Ludlow

CIDN: 1891 0100001

Division: Strategic Planning, Policy and Marketing

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

THE IMPACT OF INHERITANCES ON THE MORTGAGE MARKET IN CANADA.

The objective of this research is to investigate the impact of inheritances on the mortgage market in Canada.

CMHC Project Officer: David Metzak

CIDN: 1588 100001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INVESTIGATION INTO THE CAUSES OF RISING MORTGAGE DEBT AND ITS IMPLICATIONS ON THE MORTGAGE MARKET.

The objectives of this project are to identify what is contributing to rising residential mortgage debt; how this is impacting the ability of households to pay their mortgages and other debts; and the overall impacts, both now and into the future, on rising debt levels.

CMHC Project Officer: Orlando Manti

CIDN: 1758 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

MANAGING THE RISKS ASSOCIATED WITH A REVERSE EQUITY MORTGAGE (REM) LOAN INSURANCE PORTFOLIO.

The purpose of this project is to complete a study on the management of risks associated with an insured reverse equity mortgage (REM) portfolio.

CMHC Project Officer: Brian Davidson

CIDN: 1728 0100002

Division: Strategic Planning, Policy & Marketing

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PERSONS WITH DISABILITIES

ACCESSIBLE DOWNTOWN RESIDENTIAL COMMUNITIES: A CASE STUDY OF WINNIPEG, MANITOBA.

The purpose of this project is to examine housing and community design needs of persons with disabilities, including the elderly, to determine how these needs could be met in a downtown residential location as part of the revitalization of a downtown area.

CMHC Project Officer: Tom Parker

CIDN: 2017 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Nancy Klos, Institute of Urban Studies
University of Winnipeg, 346 Portage Avenue
Winnipeg, Manitoba R3C 0C3

*** NEW ***

AVAILABILITY: Publication not yet available

ADAPTING LOW-RISE RESIDENTIAL BUILDINGS.

This document will provide valuable guidance on incorporating features which enhance accessibility of low-rise apartments for people with disabilities. It has national applicability with references to Canadian codes and standards. It is scheduled to be available in the summer of 1998.

CMHC Project Officer: Tom Parker

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

IMPROVEMENT OF THE DESIGN AND ENVIRONMENT OF HOUSING WITH SUPPORT FOR PERSONS WITH DEMENTIA

The objective of this project is to identify the difficulties associated with orientation in space that can occur in an architectural environment such as that of a nursing home, in view of generating methods of intervention.

CMHC Project Officer: Luis Rodriguez

CIDN: 1638 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Romedi Passini, Full Professor
School of Architecture, Université de Montréal
Montreal, Quebec H3C 3J7

AVAILABILITY: Publication not yet available

PERSONS WITH DISABILITIES

EVALUATION OF HOUSING INITIATIVES UNDER THE NATIONAL STRATEGY FOR THE INTEGRATION OF PERSONS WITH DISABILITIES.

This is the final report from the evaluation study of CMHC'S activities under the National Strategy for the Integration of Persons with Disabilities over the 1991 to 1995 period.

The National Strategy for the Integration of Persons with Disabilities (NSIPD) was a five year federal program announced in 1991 to enhance the participation of persons with disabilities in the social and economic mainstream of Canadian society. CMHC undertook two main activities in support of the National Strategy. The \$10.M Home Adaptation for Seniors Independence (HASI) pilot program was to assist seniors with diminishing abilities to continue living independently in their homes and a \$3.2 M research and demonstration initiative was to develop design and construction solutions to improve the living conditions of all persons with disabilities. The HASI Program has been subsequently renewed and CMHC continues to conduct research and demonstration activities to improve the living conditions of persons with disabilities.

Key Findings and Conclusions - HASI Program

The evaluation team found that the program addressed a need. There was a very high proportion of low income seniors with disabilities who wished to remain at home. The Team also found that the program was logically designed to achieve its objectives of providing equal access to housing for persons with disabilities and that the program had the potential to reduce long term health care costs.

The HASI program was found to be well targeted to low income seniors with age related disabilities. Home modifications financed by the Program improved the comfort, safety and quality of life of clients and allowed as many as one third of them to pursue an independent life style at home rather than having to move to a care facility. Over fifty percent of clients made the minor adaptations to their homes only because of the financial assistance available under HASI, while the balance would have made the modifications anyhow. The level of assistance was generally appropriate, albeit most clients contributed their own funds to the cost of modifications and most indicated that there were additional modifications needed to their homes which they were unable to afford.

With respect to program delivery, the evaluation team found that the initial low key approach to program promotion was ineffective in generating clients for the program, although subsequent efforts to increase take up were successful. It found that clients were satisfied with most aspects of the application and approval process, although there was some evidence that the forms could have been simplified. The vast majority of clients reported no problems during the process of hiring professional renovators to do the work. The evaluation team found that the HASI Program was cost effective. The total cost of the Program was offset by the cost savings realised by society as a result of the 32 percent of clients being permitted to remain at home for a year or longer rather than having to move to a care facility.

Key Findings and Conclusions - Research and Demonstration Initiatives.

The evaluation team found that there was a need for information in the area of housing persons with disabilities and that CMHC, as the federal government housing agency, was in an excellent position to carry out this work. The evaluation team found that CMHC was successful in increasing awareness of the housing needs of persons with disabilities and that the information led some to make home modifications. It concluded that CMHC's research and information projects can be expected to have important impacts on the quality of housing in the

PERSONS WITH DISABILITIES

area of housing for persons with disabilities. CMHC's publications in the area of housing persons with disabilities were relevant, of high quality and timely. But many did not know that they existed. Some felt that the information should also be available through on-line computer access and in a CD ROM format.

Prepared by Audit and Evaluation Services, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
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K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NOTE: Aussi disponible en français sous le titre : *Évaluation des initiatives de logement dans le cadre de la Stratégie nationale pour l'intégration des personnes handicapées.*

HOUSING NEEDS OF PEOPLE WITH DISABILITIES.

The objective of this project is to provide a profile of the housing characteristics and needs of people with disabilities using data from the 1991 Census and post-censal Health and Activity Limitations Survey (HALS).

CMHC Project Officer: Jamie Angus

CIDN: 1045 0200003

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NARRATIVES ON DEDICATED AND INTEGRATED HOUSING ALTERNATIVES.

The purpose of this project to conduct 3 focus groups (10 in each focus group) with consumers of mental health services residing in self-contained units in three housing settings. These housing settings have off-site support staff.

CMHC Project Officer: Luis Rodriguez

CIDN: 1452 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Katherine M. Boydell, Queen Street Mental Health Centre
1001 Queen Street West
Toronto, Ontario, M6J 1H4

AVAILABILITY: Publication not yet available

PERSONS WITH DISABILITIES

AN OUTLOOK ON MENTAL HEALTH CONSUMERS HOUSING NEEDS.

The objective of this research is to examine the supportive housing needs of the severely chronically mentally ill in the Manitoulin-Sudbury District by location and by language, culture and gender.

CMHC Project Officer: Teresa van den Boogaard

CIDN: 1852 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Geneviève Gibbons, Canadian Mental Health Association
111 Elm Street
Sudbury, Ontario, P3C 1T3

AVAILABILITY: Publication not yet available

* NEW *

PROPERTY MANAGEMENT

CURRENT CONDITIONS IN THE RESIDENTIAL PROPERTY MANAGEMENT INDUSTRY.

The objectives of this project are to produce a profile of the residential property management industry that will complement recently completed market research on the industry; identify the state-of-the-art currently available information on issues where the greatest need for information exists; and determine the nature and depth of information gaps and research needs.

CMHC Project Officer: David Scherlowski

CIDN: 1966 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

THE COMMUNITY ORIENTED MODEL OF THE LIVED ENVIRONMENT.

The objective of this project is to update and revise measures and data sources for indicators and specific measures for the Community Oriented Model of the Lived Environment (COMLE) and update the annotated bibliography of quality of life research.

CMHC Project Officer: Jamie Angus

CIDN: 1680 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

QUALITY OF LIFE INDICATORS: A PILOT TEST OF THE COMMUNITY ORIENTED MODEL OF THE LIVED ENVIRONMENT.

The purpose of this study was to conduct a pilot test of the Community Oriented Model of the Lived Environment (COMLE). COMLE provides an approach for applying 40 quality of life indicators in municipalities, and makes a direct link between quality of life and urban sustainability. The first version of COMLE was produced in 1992 and successfully tested in 1993 by three Canadian municipalities - Quebec City, Toronto and Fort McMurray. Subsequently, COMLE was used in 1995 for a major study on quality of life in the Greater Toronto Area (GTA). This report presents the results and lessons learned from the 1993 pilot test.

The report describes the parameters of the pilot test, and summarizes the experiences of the participating municipalities (their full reports are in the appendices). The primary objective of the test was to have practitioners in municipal government evaluate the model under normal working conditions. The test lasted about 13 weeks and required the equivalent of just over one month of staff time. Each city made a unique contribution.

The test confirmed that the structure of COMLE is valid and meaningful for use at the local level. The report recommends improvements to the model, discusses its limitations, and states some conditions for its successful use. Since the model is based on objective indicators, it is necessarily incomplete and should be supplemented with qualitative information. Statistical measures require interpretation to be properly understood; therefore, users should provide context and commentary in their reports. Although the model suggests a list of indicators, users are encouraged to adapt it to individual circumstances, which means considering at the outset the nature of local issues and the audience for the resulting report.

Prepared by David H. Sherwood. Prepared for the Centre for Future Studies in Housing and Living Environments, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1996.

Order number: PE0264. ** Price: \$12.95 + GST and handling charges. **STATUS:** Completed Report

AVAILABLE: CMHC Information Products, 700 Montreal Road, Suite 1000, Ottawa, Ontario, K1A 0P7. Tel.: 1-800-668-2642. Fax orders from Canada: 1-800-245-9274. International clients see page 9 for order instructions.

NOTE : Aussi disponible en français sous le titre : *Indicateurs de la qualité de vie : essai pilote du Modèle d'orientation communautaire de l'environnement habité (PF0264).*

REAL ESTATE INVESTMENT TRUSTS

PROSPECTS FOR, AND POTENTIAL IMPACTS OF, REAL ESTATE INVESTMENT TRUSTS (REITS).

The objective of this research is to assess whether or not REITs reflect a financing mechanism which could improve the affordability and financial viability of either rejuvenating existing and/or constructing new rental housing in Canada.

MHC Project Officer: David Metzak

CIDN: 2011 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Tony Wellman

*** NEW ***

236 Royal Avenue
Ottawa, Ontario, K2A 1T7

AVAILABILITY: Publication not yet available

CONSTRUCTION STANDARDS FOR ACCESSORY SUITES = NORMES DE CONSTRUCTION VISANT LES APPARTEMENTS ACCESSOIRES.

The major task facing many urban municipalities is not one of introducing accessory suites, but rather one of converting illegal suites into legal dwelling units. The City of Saskatoon wanted to encourage its landlords to upgrade illegal suites to acceptable standards of health and safety, while helping to make the process as straightforward and economical as possible. In this way, the City would improve the quality of existing dwellings and ensure the continuing availability of affordable housing. Several other cities in Canada have undertaken regulatory reform projects regarding secondary suites and the conversion of illegal units.

The City received an A.C.T. grant in 1993 to proceed with its project, which consisted of four phases:

- **Phase One** -- the project team reviewed existing regulations (zoning by-law, and building and fire codes) and literature on accessory suites.
- **Phase Two** -- a sample of suites was inspected in an inner-city test area to determine the type and extent of violations that actually existed.
- **Phase Three** -- the project team assessed the City's zoning by-law requirements for accessory suites and developed an evaluation procedure to encourage compliance.
- **Phase Four** -- educational materials were developed (a four-page brochure, a pamphlet and a short video) to inform landlords about compliance requirements and the upgrading process.

The inspections in the second phase revealed several items typically not up to standard. The City addressed these in its educational materials. The City also emphasized its intent to ensure compliance with National Building Code (NBC) guidelines and Saskatoon's zoning by-law, while encouraging the continued presence of accessory suites.

As a result of the project, the City of Saskatoon determined that it needed to make a clear differentiation between accessory suites and other types of apartment dwellings, since the lack of distinction had proven to be confusing. The City defined an accessory suite as a second, self-contained unit in a house originally planned as a single-family dwelling. Where three or more units existed in one structure, the City treated them as apartment units that were required to comply with zoning and building code regulations relating to multiple-unit dwellings. This distinction allowed the Planning and Building Department to formulate appropriate guidelines aimed at encouraging the availability of accessory suites as a safe, affordable housing option, while recognizing their unique presence in residential neighbourhoods.

Affordability and Choice Today (A.C.T.) Streamlined Approval Process Project / City of Saskatoon, Saskatoon, Saskatchewan. Prepared by: Energy Pathways Inc. Prepared for: Federation of Canadian Municipalities, Canadian Home Builders' Association, Canadian Housing and Renewal Association and Canada Mortgage and Housing Corporation. Ottawa: The Federation: The Associations: The Corporation, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
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NOTE: Bilingual/bilingue.

REGULATORY REFORM

"GARDEN SUITES" PILOT PROJECT: CASE STUDY = PROJET PILOTE DE MAIRILLONS-JARDINS : ÉTUDE DE CAS.

In 1990, Interchurch Housing Society (ICHS), a charitable non-profit organization, received an A-C-T grant to do the groundwork for the introduction of garden suites in Kings County, Nova Scotia. To demonstrate the different regulatory requirements for urban and rural sites, it proposed to deploy two units; one in a rural setting and the other in an urban setting. The objective was to allow the community to view this form of housing and evaluate the degree of success of the project in order to set the stage for future deployments.

Interchurch met several times with the County to identify a procedure for selecting a site and approving the proposed units. Initially, the County planned to follow a development agreement approach, but decided against doing so because of limitations in this procedure, and the possibility of obtaining provincial approvals by way of updating its planning strategy and land-use by-law. In September 1992, the Planning Strategy and Land-use by-law were submitted to the Nova Scotia Department of Municipal Affairs for approval. The Minister approved both with amendments. All provisions for garden suites were, however, deleted because there existed no authority in the *Planning Act* to control land use on the basis of ownership of a structure.

Over the course of the following two years ICHS worked with the provincial lobby group, Affordable Housing Association of Nova Scotia (AHANS), to lobby the province to give municipalities the desired authority to allow garden suites. In September 1994, the Province confirmed that it was considering draft legislation to amend local planning regulations. In December 1994, Interchurch Housing Society requested that its A-C-T project be terminated since it had no opportunity to influence the proposed legislation.

Although under current legislation there is no process in Kings County which allows a family member to house a senior family member in a garden suite it could be possible in the not too distant future. This project contributed significantly to the initiation of dialogue at the provincial level on developing changes in the *Planning Act* to give municipalities the authority to regulate suites.

Affordability and Choice Today (A.C.T.) Demonstration Project : Interchurch Housing Society, Kentville, Nova Scotia. Prepared by: Rosemary Kinnis, ACT Program Manager, Federation of Canadian Municipalities. Prepared for: Federation of Canadian Municipalities, Canadian Home Builders' Association, Canadian Housing and Renewal Association and Canada Mortgage and Housing Corporation. Ottawa: The Federation: The Associations: The Corporation, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
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NOTE: Bilingual/bilingue.

REGULATORY REFORM

LEGALIZATION OF SECONDARY SUITES IN SURREY, B.C.: CASE STUDY = LA LÉGALISATION DES APPARTEMENTS ACCESSOIRES À SURREY (C.-B.) : ÉTUDE DE CAS.

In 1990, the City of Surrey, British Columbia launched a program to legalize secondary suites that met basic health and safety standards. The objectives of the program were to better manage the impacts of secondary suites on neighbourhoods and municipal services, and to accommodate new convertible housing designs for affordable home ownership.

The legalization process involved the adoption of new zones and regulations. Council, in August 1992, (after consultation with the community) divided the municipality into three types of secondary suite policy areas: areas where secondary suites were to be allowed and rezoned by Council (Area Rezoning); areas where individual units could be rezoned (Spot Rezoning); and areas where secondary suites were not permitted at all (Single-Family Only). The Spot Rezoning designation was eliminated in December 1994.

To facilitate administration, Council adopted a secondary suite policy which included the following five conditions for approval of suites:

- a secondary suite can be located in a single-family home only, not in a duplex;
- the applicant must either own or live in the main unit;
- the secondary suite cannot be larger than 90 square meters;
- one additional parking space must be provided; and,
- only one secondary suite is permitted per single-family home.

To ensure that basic health and safety standards are met, the City also developed various technical and regulatory requirements for the suites.

Despite efforts to legalize suites through the secondary suite program only a handful of properties have been legalized. In 1995, Council authorized the formation of a committee to review the program. The main concerns the committee examined were that the suite process is quite complex and lengthy; suites are not permitted in many areas; and Surrey is not collecting very much of the potential tax and licensing revenue from properties with suites. It explored these issues in depth and developed draft solutions.

A staff report containing recommendations based on the Committee's draft solutions was approved by Council in September 1996. It forms the basis for a new approach to regulating secondary suites in Surrey. This approach is aimed at accomplishing the legalization of more suites through an easier and simpler administrative process for the public, Council and staff. Changes will be made to the by-law enforcement and revenue collection procedures and this could lead to improvements in services to areas in which suites are provided.

Affordability and Choice Today (A.C.T.) Case Study Project / City of Surrey, British Columbia. Prepared by: Rosemary Kinnis and David Scherlowski. Prepared for: Federation of Canadian Municipalities; Canadian Home Builders' Association; Canadian Housing and Renewal Association; and Canada Mortgage and Housing Corporation. Ottawa: The Federation: The Associations: The Corporation, 1997.

STATUS: Completed Report

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NOTE: Bilingual/bilingue.

REGULATORY REFORM

MEDIATION AS A TOOL TO RESOLVE LAND-USE DISPUTES: HOW KAMLOOPS INTEGRATED MEDIATION INTO ITS LAND DEVELOPMENT APPROVAL PROCESS: CASE STUDY = LA MÉDIATION : UN OUTIL DE RÉOLUTION DES CONFLITS SUR LES UTILISATIONS DES SOLS : COMMENT KAMLOOPS A INTÉGRÉ LA MÉDIATION DANS SON PROCESSUS D'APPROBATION DES PROJETS D'AMÉNAGEMENT FONCIER : ÉTUDE DE CAS.

The traditional tool used to resolve land development disputes is the public hearing process. Adversarial in nature, it often produces a win-lose outcome that may only deepen the bitterness and divisions in a community. Recognizing these shortcomings, cities across the country are designing new strategies that aim to increase public participation in community growth decisions without strangling needed development. Many of these approaches, however, carry price tags that make them inappropriate for councils under pressure to hold the line on taxes. Kamloops Council was in this situation so it decided to provide the option of mediation at the rezoning stage as a cost-effective way to enhance public involvement in land development proposals.

The City first tried using its own planners in the role of mediators. While this proved to be an inappropriate role for city planners, their efforts did prove that mediation could work. Thus encouraged, the City authorized an Alternative Dispute Resolution (ADR) Task Force to help the city design a mediation process that would be part of the City's development approval process. The City was awarded an A.C.T. grant to help defray the costs of developing and implementing the mediation process.

The process, approved by Council in February 1996, set up a Mediation Services Group composed of residents from the community who would mediate land-use disputes on a volunteer basis. The mediators were screened to ensure they did not belong to any groups related to the development industry or to anti-development organizations. They attended workshops where they were taught land development issues and procedures and the theory and techniques of alternative dispute resolution. Now a developer, foreseeing public resistance to a proposal, can ask the City to approve mediation to resolve the potential dispute before the proposal goes to a public hearing. Developers applying for the service pay a nominal fee of \$350 - kept deliberately low to encourage its use.

The initiative resulted in regulatory reform as the City had to amend its land development approval by-laws to formally include the mediation option. Other municipalities can also benefit from the Kamloops initiative, which provides a model they can follow to include mediation in their own operations.

Affordability and Choice Today (A.C.T.) Streamlined Approval Process Project - Development Services Department, City of Kamloops, British Columbia. Prepared by: Word-Works Communications Services Prepared for: Federation of Canadian Municipalities; Canadian Home Builders' Association; Canadian Housing and Renewal Association; and Canada Mortgage and Housing Corporation. Ottawa: The Federation; The Associations; The Corporation, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation
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NOTE: Bilingual/bilingue.

REGULATORY REFORM

PLANNING COHOUSING = LA PLANIFICATION DES ENSEMBLES D'HABITATION COMMUNAUTAIRES.

Creative Communities, a multi-unit housing builder/developer, and the Collaborative Housing Society received an A.C.T. grant in 1993 to research and produce a handbook on planning and zoning issues that affect cohousing projects.

The project team worked with cohousing groups and municipalities in the Greater Toronto Area to develop the handbook, which was intended to serve two main purposes:

- To assist groups in understanding the development approval process;
- To help municipal planners understand the concept of cohousing and appreciate the intentions of cohousing groups.

Research conducted for the project involved the following components:

- A survey of the specific development needs and interests of cohousing groups and their experience with, and perception of, the planning process;
- A survey of the regulatory environment, involving interviews with representatives from four municipal planning departments;
- A one-day charrette involving cohousing groups and municipal planners.

The research showed that cohousing groups and planners can benefit by working together. Municipal planners can help groups understand the planning process, and groups can help planners understand the benefits inherent in cohousing development. In some cases where regulatory barriers were encountered, cohousing groups have worked with planners to arrive at mutually beneficial solutions.

External collaboration with planners and neighbours emerged as being as significant to the success of a cohousing development as internal collaboration within a cohousing group itself. The project team found that a lack of such collaboration early in the process could pose a real barrier to cohousing development, and that open dialogue was a critical factor. Representatives from each of the four municipal planning departments involved in the project were interested in supporting the cohousing option, especially as they learned more about individual cohousing projects and understood them.

Affordability and Choice Today (A.C.T.) Streamlined Approval Process Project / Creative Communities and the Collaborative Housing Society, Toronto, Ontario. Prepared by: Energy Pathways Inc. Prepared for: Federation of Canadian Municipalities; Canadian Home Builders' Association; Canadian Housing and Renewal Association; Canada Mortgage and Housing Corporation. Ottawa: The Federation: The Associations: CMHC, 1997.

STATUS: Completed Report

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NOTE: Bilingual/bilingue.

REGULATORY REFORM

SMALL-LOT SINGLE FAMILY INFILL HOUSING: CASE STUDY = CONSTRUCTION DE MAISONS INDIVIDUELLES INTERCALAIRES SUR DE PETITS TERRAINS : ÉTUDE DE CAS.

In November 1990, the City of Victoria received an A.C.T. grant to demonstrate that integrating new housing into established neighbourhoods (infill development) can, under appropriate design guidelines, improve the quality, choice and affordability of housing. The City of Victoria proposed to undertake its A.C.T. project in two phases. In the first phase it would examine community concerns and reflect them in developing clear design guidelines that must be considered when designing infill housing, and in developing a zoning by-law which would regulate some aspects of the houses such as size, proximity to street and parking requirements. In the second phase, the approaches developed in phase one would be tested and demonstrated by building three houses.

The project was launched by first establishing a project team comprising all the key stakeholders: community groups, representatives from the building industry, and City staff and Council. Small lot design guidelines applied in other cities were examined and analyzed to determine their appropriateness for Victoria. The team brought the results of this research to the residents and the development community to obtain their input. With the results of the research and community input, the City proceeded to draft the new design guidelines and zoning by-law.

Construction of the three units was completed in March 1995. Soon after, the City officially launched the demonstration with an opening ceremony and the houses remained open for two weeks to allow for public viewing. An important component of the project was measuring community acceptance. Results indicate that the vast majority of the respondents thought that the project suited the neighbourhood and was a positive development.

All three units have been sold with prices around \$204,000, comparing favourably with new single family homes in this location which normally sell for approximately \$280,000.

Affordability and Choice Today (A.C.T.) Demonstration Project / City of Victoria. Prepared by: Rosemary Kinnis, Act Program Manager, Federation of Canadian Municipalities. Prepared for: Federation of Canadian Municipalities, Canadian Home Builders' Association, Canadian Housing and Renewal Association and Canada Mortgage and Housing Corporation. Ottawa: The Federation: The Associations: The Corporation, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NOTE: Bilingual/bilingue.

RENOVATION

ANALYSIS OF RENTAL REPAIR AND RENOVATION EXPENDITURE SURVEY - 1995.

The purpose of this project is to conduct the analysis of the "Rental Repair and Renovation Expenditure Survey - 1995".

CMHC Project Officer: Roger Lewis

CIDN: 1888 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOMEOWNER MOTIVATION AND INNER CITY REVITALIZATION: AN EXAMINATION OF RELATED FACTORS IN WINNIPEG.

The objective of this research is to identify the revitalization process underway (e.g.) incumbent upgrading or gentrification in inner city areas demonstrating a high level of renovation activity.

CMHC Project Officer: Glynis Kossatz

CIDN: 1277 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Tom Carter, University of Winnipeg, Dept. of Geography
Winnipeg, Manitoba, R3B 2E9

RENTAL HOUSING

THE PRIVATE RENTAL HOUSING SECTOR AND ITS NEW CLIENT GROUP

A review of the literature (including research on the Internet) will be aimed at identifying approaches and programs targeting harmonious relations between landlords and their new client group.

CMHC Project Officer: Benoit Sanscartier

CIDN: 1648 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Luba Serge
29 Easton Street
Montreal, Quebec H4X 1K9

AVAILABILITY: Publication not yet available

RENTAL HOUSING

RENTERS AND THEIR HOUSING CONDITIONS: FROM THE 1980s INTO THE 1990s.

The purpose of this project is to examine how and why the circumstance of renter households changed over the last fifteen years, with special focus on housing conditions, and the social and economic factors associated with changes in the level and nature of housing need.

CMHC Project Officer: John Engeland

CIDN: 1582 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RESIDUALIZATION OF RENTAL TENURE: ATTITUDES OF PRIVATE LANDLORDS TOWARD HOUSING LOW INCOME HOUSEHOLDS.

The objective of this research study was to determine whether or not a gradual process of change in the profile of tenants in the private rental sector is occurring. It was hypothesized that this trend, here labeled "residualization", is evolving and that it may have important consequences for government policy.

The research has employed three approaches to this exploration: a literature analysis; a statistical analysis of existing data on household characteristics; and a qualitative survey of two subgroups of rental investors-- recent vendors and purchasers.

The study concludes by outlining the imperative for some policy attention on the rental market. In particular, it is noted that there is not a level playing field in terms of support for ownership and rental tenure. There has long been a preoccupation with increasing access to homeownership. To the extent that the rental market and homeownership sector are closely related, initiatives to enhance access to ownership contribute to weakening demand in the rental sector and are a factor in the trend to residualization. The residualizing trend has been identified as a factor impacting the attractiveness of investment in the rental sector.

The need for a mixed policy approach is identified. This could include various types of demand side programs, such as shelter allowances and rent supplements, but should also be balanced with initiatives to assist the non-profit sector to acquire existing properties in which the private sector appears to be disinterested. The study found that a large number of properties are put up for sale each year and these are often available at a price that would approach an affordable level for lower income households. Currently however, non-profit organizations do not have the capital to pursue such opportunities.

The study identifies an important distinction between discrimination and prudent management. It is argued that landlords are not necessarily adverse to specific household types, they simply associate risk of default and bad debt with certain characteristics. An appropriate policy response would be to focus on mitigating risk. This could be pursued through some form of insurance program that protects investors against these risks. An

RENTAL HOUSING

insurance program does not entirely mitigate risk, nor would it necessarily eliminate selectivity. However, it would formalize an objective system of risk analysis and could help to reduce the barriers that currently confront many lower income households purely on the basis of stereotyping.

Prepared by Steve Pomeroy, Focus Consulting Inc. CMHC Project Officer: Benoît Sanscartier. Ottawa: Canada Mortgage and Housing Corporation, 1998 (External Research Program)

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

NOTE: Bilingual/bilingue.

REVIEW OF METHODS GOVERNMENTS HAVE EMPLOYED TO SUPPORT PRIVATE RENTAL HOUSING.

The objective of this project is to develop a thorough understanding of the programs and policies employed by governments both domestically and internationally to support private rental housing.

CMHC Project Officer: David Metzak

CIDN: 1885 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

UNDERSTANDING PRIVATE RENTAL HOUSING INVESTMENT IN CANADA.

The project will investigate rental housing investment in Canada and establish a basis from which public and private decision makers can clearly understand the environment for investment in, and development of, rental housing.

CMHC Project Officer: Tim Elliot

CIDN: 1748 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RESIDENTIAL DEVELOPMENT

ALTERNATIVE PLANNING AND REGULATORY APPROACHES USED IN OTHER COUNTRIES.

This project investigates and documents international experiences that may offer potentially useful lessons and insights on the application of performance-based planning and regulatory approaches and systems, and the use of financial and economic incentives to improve the flexibility and effectiveness of the development environment.

CMHC Project Officer: Jamie Angus

CIDN: 1775 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CRITICAL SUCCESS FACTORS ENABLING ALTERNATIVE RESIDENTIAL DEVELOPMENT STANDARDS.

This research is to determine where there are certain instruments, strategies or conditions that enhance the prospects of changing or relaxing rules and regulations with respect to residential development. The grant recipient will discuss with seasoned individuals how they might approach the regional land use issues now under much scrutiny.

CMHC Project Officer: David D'Amour

CIDN: 2006 020001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Teresa Paul

*** NEW ***

10937-79th Avenue

Edmonton, Alberta, T6G 0P1

AVAILABILITY: Publication not yet available

INCREASING URBAN DENSITIES TO ACCOMMODATE POPULATION GROWTH.

This project examines the issue of urban density in order to deal with population growth pressures, taking into account public policy and regulations, private development decisions, and urban form, with a view toward projecting the implications of growth in terms of built form, land consumption, infrastructure, and the distribution of housing.

CMHC Project Officer: Fanis Grammenos

CIDN: 1844 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Gerald Daly, Daly & Associates

Box 139, RR #4

Flesherton, Ontario, N0C 1E0

AVAILABILITY: Publication not yet available

RESIDENTIAL DEVELOPMENT

THE INFORMATION REVOLUTION AND RESIDENTIAL DEVELOPMENT.

The objective of this research is to examine residential development within the context of the information revolution.

CMHC Project Officer: Benoit Sanscartier

CIDN: 2014 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Pamela Blais

182 Crawford Street
Toronto, Ontario M6J 2V6

*** NEW ***

AVAILABILITY: Publication not yet available

RESIDENTIAL INTENSIFICATION IN CENTRAL DISTRICTS

The objective of this research is to examine the phenomenon of residential intensification in a dense urban sector using data on the new housing built there in the last five years and on the new residents who live there, in view of drawing lessons for the renewal of central districts in large Canadian cities.

CMHC Project Officer: Mark Holzman

CIDN: 2012 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Jocelyn Duff, Habitat sur mesure

4626 Bordeaux Street
Montreal, Quebec, H2H 2A1

*** NEW ***

AVAILABILITY: Publication not yet available

RESIDENTIAL STREET DESIGN: LEARNING FROM SUBURBIA.

The purpose of this research project is to generate concrete residential street design solutions based upon a thorough understanding of precedents, and introduce and stimulate new ideas for land developers and design professionals.

CMHC Project Officer: Fanis Grammenos

CIDN: 1644 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Sevag Pogharian , Sevag Pogharian Design

4643 Sherbrooke Street West, Suite 12
Montreal, Quebec, H3Z 1G2

AVAILABILITY: Publication not yet available

ROOFTOP GARDENS

ROOFTOP AND VERTICAL GARDENS: IDENTIFYING OPPORTUNITIES AND BARRIERS TO WIDESPREAD USE.

The purpose of this project is to develop a Canadian "status report" on rooftop and vertical gardens.

CMHC Project Officer: Susan Fisher

CIDN: 2005 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Steven Peck

*** NEW ***

35-859 Millwood Road

Toronto, Ontario, M4G 1W7

AVAILABILITY: Publication not yet available

SENIORS

ASSESSMENT OF PHASE I OF THE BENNY FARM RE-DEVELOPMENT PROJECT.

This research will determine the effectiveness of the approach taken by CMHC to relocate the residents of the Benny Farm Project and find out how well the new housing meets the residents' current and future needs and preferences for accommodations.

CMHC Project Officer: Luis Rodriguez

CIDN: 1751 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOME ENVIRONMENTS AND FALLS BY SENIORS

The purpose of this project is to determine the significance of environmental factors that are likely to cause falls among independent and active seniors living in their own homes within the territory of the Québec Urban Community.

CMHC Project Officer: Luis Rodriguez

CIDN: 1843 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Benoît Lévesque

Centre de santé publique de Québec

2050 René-Lévesque Blvd.

Sainte-Foy, Quebec G1V 2K8

AVAILABILITY: Publication not yet available

SENIORS

INTERVENTION MODELS: SAFETY IN CASES OF EMERGENCY OF PERSONS WITH REDUCED MOBILITY AND SENIORS LOSING THEIR INDEPENDENCE LIVING IN REGULAR RESIDENTIAL ENVIRONMENTS

This study is aimed at integrating current knowledge and reflections concerning the problems associated with the safety of seniors and persons with disabilities living in regular residential environments, in order to apply them to the development of intervention models for three multiple-family buildings equipped with elevators.

CMHC Project Officer: Luis Rodriguez

CIDN: 460 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Sylvie Quintin, Société d'habitations communautaires logique inc.
3250 St-Joseph Blvd. East
Montreal, Quebec H1Y 3G2

AVAILABILITY: Publication not yet available

LIVING AT HOME OR IN A RESIDENCE: A CHALLENGE FOR SENIORS AND WORKERS

The objective of this project is to examine, in Quebec's Saguenay area, the circumstances, constraints, limitations and difficulties encountered by clients who receive home care and the organizations that provide it.

CMHC Project Officer: Luis Rodriguez

CIDN: 1641 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Danielle Maltais, Université du Québec à Chicoutimi
555 de l'Université Blvd.
Chicoutimi, Quebec G7H 2B1

AVAILABILITY: Publication not yet available

MAINTAINING SENIORS INDEPENDENCE IN RURAL AREAS: A GUIDE TO PLANNING FOR HOUSING AND SUPPORT SERVICES.

The purpose of this project is to produce the final manuscript of a revised version of CMHC's current publication "Maintaining Seniors Independence in Rural Areas: A Guide to Planning for Housing and Support Services" (NHA 6298).

CMHC Project Officer: Luis Rodriguez

CIDN: 1780 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NEIGHBOURHOOD GROUP HOMES FOR THE ELDERLY: THE PLANNING, DESIGN AND DEVELOPMENT PROCESS.

This study focuses on sheltered housing projects, to the extent that they are limited to small numbers of units. The goal of this project was to produce a guidebook appropriate to the Canadian context which analyses and documents the planning, financing, site selection, design, development, start-up and marketing process of a sample of Canadian Abbeyfield Houses, and other small-group housing for the elderly. Case histories were collected with respect to the context and circumstances of their development, the key players in this process and their roles. Comparison and critical analysis of these projects' development experience provides insight into the process of implementing this residential option. The specific problems experienced and their respective solutions are highlighted. The potential contribution of this report to the housing industry is in *facilitating easier and faster development* of supportive group homes in existing neighbourhoods.

The report begins with a general introductory chapter, including background, context and definition of the housing model. This is followed by a brief review of the literature on the topic, highlights of the policy relevance of this research, and a summary of the aims of the study. A brief outline of the methodology is included next, with a full discussion in Appendix B. The main body of the report constitutes presentation of findings organized by key analytical variables, including tables comparing the 22 case studies. These variables are divided between those important before and during development, and those afterward. The three final chapters include a discussion of advantages and obstacles encountered by the project sponsors, a typology of projects highlighting patterns and anomalies, and finally, conclusions and recommendations. This is followed immediately by a list of references and an annotated bibliography, organized by major topic headings, which provides a rich source of information for those wishing to do further research. Project profile sheets, with key facts and illustrations, can be found in Appendix A; Appendix C contains a detailed discussion of case study project selection criteria.

Prepared by Mary Ann Clarke Scott. CMHC Project Officer: Luis Rodriguez. Ottawa: Canada Mortgage and Housing Corporation, 1997. (External Research Program)

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

SENIORS

PREDICTING THE ADJUSTMENT OF ELDERLY PERSONS TO CONGREGATE CARE HOUSING.

The purpose of this project is to undertake research to complement the conventional post-occupancy studies which tend to emphasize assessing the housing environment rather than the well-being of individual occupants.

CMHC Project Officer: Glynis Kossatz

CIDN: 1827 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Dr. Robert Gifford, Optimal Environment Inc.
2311 Edgelow Street
Victoria, British Columbia, V8N 1R6

AVAILABILITY: Publication not yet available

THE PRIVATE RENTAL MARKET: ADAPTING TO THE NEEDS OF AGING TENANTS.

This research will identify the extent to which landlords in the private rental market across Canada are accommodating the needs of aging tenants, and describe and develop measures that would help landlords deal more effectively with tenant needs.

CMHC Project Officer: Luis Rodriguez

CIDN: 1996 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Kathleen Mancor, DKM Housing Consultants
141-6200 McKay Avenue
Burnaby, British Columbia, V5H 4M9

*** NEW ***

AVAILABILITY: Publication not yet available

PRIVATE RETIREMENT HOME RESOURCES IN QUEBEC

The objective of this project is to evaluate the safety and functionality of non-institutional private retirement home designs in Quebec with regard to frail senior clients who could present cognitive deficiencies.

CMHC Project Officer: Jean-François Dion, Québec Branch Office

CIDN: 1846 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Daniel Pelletier
Université Laval, Pavillon Charles-de-Koninck, Cité universitaire
Sainte-Foy, Quebec G1K 7P4

AVAILABILITY: Publication not yet available

SENIORS

USER SATISFACTION STUDY OF HOUSING OPTIONS FOR OLDER CANADIANS.

The objective of this research is to carry out user satisfaction studies of some of the newer housing options that are currently available to older Canadians, and to produce an objective and detailed report based on the results of the research.

CMHC Project Officer: Luis Rodriguez

CIDN: 1583 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SOCIAL HOUSING

THE DEVELOPMENT OF A PROFILE OF MARKET RENTERS IN SOCIAL HOUSING.

The study is a comparative analysis of market renters in social housing (municipal non-profit and private non-profit) versus those in private rental housing to determine the extent to which there are differences in the characteristics and preferences between the two groups, and to develop a profile of market renters in social housing.

CMHC Project Officer: Patricia Streich

CIDN: 1836 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Lorraine Copas, Community Focus Consulting
700-106 Goodwood Park Court
Toronto, Ontario, M4C 2H1

AVAILABILITY: Publication not yet available

MICRO ENTERPRISE AND HOME BUSINESS AS A TRANSITIONAL PLANNING CATALYST IN SOCIAL HOUSING.

The purpose of this research is to identify and analyze the key elements of the development of a program framework to permit micro enterprises and home businesses in social housing settings.

CMHC Project Officer: Phil Deacon

CIDN: 1838 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: David Bruce, Senior Research Associate, Mount Allison University
Rural and Small Town Programme
Sackville, New Brunswick, E0A 3C0

AVAILABILITY: Publication not yet available

SOCIAL HOUSING

NATIONAL ENABLEMENT DEMONSTRATION INITIATIVE.

The objective of this project is to undertake the development and coordination of a national enablement demonstration initiative to teach social housing groups the skills and techniques to use in order to develop self-help housing strategies.

CMHC Project Officer: Jamie Burr

CIDN: 1436 1500001

Division: Assisted Housing

STATUS: Ongoing Project

Grant Recipient: Canadian Housing and Renewal Association
251 Laurier Avenue West, Suite 401
Ottawa, Ontario, K1P 5J6

URBAN TRANSPORTATION

THE IMPACT OF URBAN FORM AND TRAVEL ACCESSIBILITY UPON PRIVATE VEHICLE TRAVEL.

The purpose of this study is to measure the influence of land use patterns and urban form on household travel demand and behaviour.

CMHC Project Officer: Susan Fisher

CIDN: 1752 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

URBAN TRANSPORTATION

PLANNING AND MANAGING TRAFFIC NOISE ON URBAN ROADS: INTERNATIONAL AND CANADIAN EXPERIENCE

Traffic noise on major roads in urban areas is viewed as an environmental issue with serious quality of life impacts in Europe, Australia and elsewhere. The paucity of current Canadian literature on the subject would suggest that Canada has little experience with this issue. This research identifies and describes fifteen planning and management approaches used in other countries to minimize the effects of traffic noise on residents living near arterial streets. These range from public education campaigns to low noise road surfaces, and are categorized by type of measure. Canadians should be aware of the existence of these options for addressing urban traffic noise issues. A brief survey of Canadian municipal and provincial officials reveals a general concern with traffic noise, and a range of arterial road traffic noise policies and practises, from none at all to quite comprehensive. Recommendations for further research are offered focusing on basic data gathering, current federal road and rail noise guidelines, and information dissemination.

Prepared by Margaret Eberle. CMHC Project Officer: Paula Archer. Ottawa: Canada Mortgage and Housing Corporation, 1997. (External Research Program)

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca

WOMEN & HOUSING

INVESTIGATION OF ISSUES FOR THE EVALUATION OF THE NEXT STEP PROGRAM

The purpose of this project is to conduct a literature review on second-stage housing for the Next Step Program.

CMHC Project Officer: Patricia Streich

CIDN: 1507 0500001

Division: Audit and Program Evaluation Services

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

WOMEN & HOUSING

STATE OF WOMEN AND THEIR HOUSING: 1997.

The objective of this project is to undertake and complete the study on the "State of Women and Their Housing: 1997", which develops a profile of women and their health and well-being from a housing perspective.

CMHC Project Officer: Brenda Baxter

CIDN: 1615 0100001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

YOUTH & HOUSING

HOUSING CANADA'S YOUTH.

The objective of this project is to develop social, economic, and demographic profiles of youth with an in-depth review of their current and past housing conditions, and identification and assessment of housing issues and trends into the future.

CMHC Project Officer: Ed Nera

CIDN: 1786 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

"OUT FROM THE SHADOW" - INTERNATIONAL SUMMIT OF SEXUALLY EXPLOITED YOUTH.

The purpose of this project is to gain knowledge regarding the housing-related options which can help address the key factors contributing to commercially, sexually exploited youth and the main obstacles to alleviating such circumstances.

CMHC Project Officer: Teresa van den Boogaard

CIDN: 1921 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

BIBLIOGRAPHIES

- Alternative mortgage instruments / Nouveaux modes de financement hypothécaire
(Rev. 15 p., October/octobre 1984)
- Architecture in Canada / L'architecture du Canada
(18 p., July/juillet 1983)
- Building and climatic factors / Construction et des éléments climatiques
(7 p., November/novembre 1983)
- Building in cold climates / Construction dans les pays froids
(Rev. 9 p., December/décembre 1989)
- Building laws / Législation de la construction
(Rev. 25 p., October/octobre 1986)
- Building materials / Matériaux de construction
(14 p., August/août 1987)
- Building product information / Information sur les produits pour le bâtiment
(7 p., August/août 1984)
- Children in the urban environment / Les enfants dans le milieu urbain
(23 p., January/janvier 1993)
- Cohousing / Habitation communautaire
(8p., July/juillet 1996)
- Computer-aided architectural design / Dessins architecturaux par ordinateur
(Rev. 2 p., September/septembre 1984)
- Condominium conversion / Immeubles d'habitation - transformation en copropriétés
(12 p., May/mai 1986)
- Condominiums / Copropriétés
(Rev. 12 p., March/mars 1986)
- Congregate housing / Habitat collectif
(10 p., November/novembre 1991)
- Construction industry in Canada / Industrie de la construction au Canada
(Rev. 27 p., January/janvier 1988)
- Construction industry labour / Main-d'oeuvre de la construction
(6 p., February/février 1988)
- Cooperative housing / Coopératives de logements
(Rev. 40 p., September/septembre 1988)
- Crime prevention and architectural design / Design architectural et prévention de la criminalité (7 p., May/mai 1989)
- Crime prevention and urban safety in residential environments / La prévention du crime et la sécurité dans les milieux résidentiels urbains (12 p., September/septembre 1989)

- Deinstitutionalization
(7 p., June/juin 1988)
- Desktop Publishing
(3 p., March/mars 1988)
- Development rights transfer / Transfert de droits de développement
(8 p., December/décembre 1985)
- Discrimination and segregation in housing in Canada / Bibliographie sur la discrimination et la ségrégation dans le logement au Canada (5 p., November/novembre 1991)
- Downtown redevelopment / Réaménagement de centres-villes
(Rev. 26 p., January/janvier 1989)
- Earthquakes and construction / Tremblements de terre et construction
(20 p., March/mars 1995)
- Energy conservation in multiple housing / Économie d'énergie dans les logements collectifs
(Rev. 3 p., June/juin 1983)
- Examples of housing program evaluations / Exemples d'évaluations de programmes de logement (3 p., January/janvier 1982)
- Expandable housing / Les logements expansibles
(October/octobre 1985)
- Experimental houses./ Maisons expérimentales
(6 p., January/janvier 1983)
- External Research Program Reports arranged by subject / Rapports du programme de recherche à l'extérieur par sujet (Rev. 56 p., September/septembre 1997)
- False Creek, Vancouver, British Columbia / False Creek, Vancouver, Colombie-Britannique (Rev. 4 p., November/novembre 1984)
- Federal/provincial relations and housing / Relations fédérales/provinciales et le logement (3 p., June/juin 1987)
- Foundations / Fondations
(17 p., January/janvier 1989)
- Geodesic domes / Domes géodésiques
(4 p., November/novembre 1983)
- Graduated payment mortgages / Prêts hypothécaires à paiements progressifs
(Rev. 3 p., October/octobre 1991)
- Group homes / Foyers de groupe
(Rev. 5 p., May/mai 1986)
- Halfway houses / Foyers de groupe
(Rev. 5 p., May/mai 1986)
- Home care vs institutional care / Soins à domicile ou en établissement
(3 p., April/avril 1982)
- Home equity conversion / Conversion de la valeur nette du logement
(9 p., October/octobre 1988)

- Home ownership / La propriété d'un logement
(Rev. 28 p., August/août 1987)
- *Homelessness / Sans-logis
(Rev. 61 p., June/juin 1998)
- House designs - annotated / Modèles de maisons - annotée
(12 p., June/juin 1984)
- Housing and AIDS / Hébergement des personnes atteintes du SIDA
(5 p., September/septembre 1993)
- Housing and services for the disabled / Logement et les services pour les handicapés (Rev. 68 p., April/avril 1992)
- Housing and the elderly / Le logement et les personnes âgées
(Rev. 78 p., September/septembre 1988)
- Housing conversion and residential intensification / Conversion d'habitations et intensification résidentielle (Rev. 8 p., October/octobre 1990)
- Housing costs / Prix des maisons
(12 p., August/août 1985)
- Housing demand / La demande en logement
(22 p., November/novembre 1986)
- Housing density / Densité d'habitation
(7 p., September/septembre 1985)
- Housing for immigrants and minorities / Logement pour les groupes ethniques et immigrants (7 p., May/mai 1993)
- Housing for single parent families / Le logement et les familles monoparentales
(Rev. 6 p., May/mai 1986)
- Housing for single people / Le logement et les personnes seules
(3 p., September/septembre 1984)
- Housing in Canadian municipalities / Logement dans les municipalités canadiennes (Rev. 44 p., March/mars 1985)
- Housing in New Brunswick / Logement au Nouveau-Brunswick
(7 p., March/mars 1987)
- Housing in Newfoundland / Logement à Terre-Neuve
(6 p., March/mars 1987)
- Housing in Nova Scotia / Logement en Nouvelle-Écosse
(11 p., May/mai 1987)
- Housing in Prince Edward Island / Logement dans l'Île-du-Prince-Édouard
(4 p., April/avril 1987)
- Housing in the Atlantic Provinces / Logement dans la région de l'Atlantique
(4 p., April/avril 1987)
- Housing in urban core areas / Logement dans les centres-villes
(Rev. 13 p., January/janvier 1985)

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CURRENT HOUSING RESEARCH ORDER FORM

If you wish to receive any of the completed reports or bibliographies listed, or if you would like to be on the mailing list to receive *Current Housing Research*, please fill out this form and send it to:

Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa ON K1A 0P7
Fax (613) 748-4069
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INTRODUCTION

Welcome to the second issue of "*Current Housing Research*". This publication merges "*Housing Research Quarterly*" and "*Current Housing Technology Initiatives*" and continues the numbering of the "*Housing Research Quarterly*".

Under Part IX of the National Housing Act the Government of Canada provides funds to Canada Mortgage and Housing Corporation to conduct research into the social, economic and technical aspects of housing and related fields.

Current Housing Research is compiled and produced three times a year by the Canadian Housing Information Centre. This publication provides information and access to research which is undertaken and sponsored by the Corporation. It is also available on CMHC's Website at chic@cmhc-schl.gc.ca

The publication contains information on completed research reports, new publications, videos and bibliographies, as well as planned and ongoing research projects. An alphabetical title index of items listed is included at the end for quick reference.

The overall arrangement of "*Current Housing Research*" is by broad subject category. Within each subject category, lists of planned and ongoing projects and completed research reports are described.

Each entry can contain the following elements:

- The project or report title;
- A description of the project or report results;
- The CMHC Project Officer who is managing the project;
- The Division within CMHC which is responsible for the project;
- For External Research Projects, the grant recipient undertaking the research;
- A Contract Identification Number (CIDN);

- The Status of the project: whether the project is in a planned, ongoing or completed phase. "Planned Projects" are those that are not yet underway, but are likely to be initiated in the current year. "Ongoing Projects" refer to research projects which are currently underway. No reports are yet available. Once the project is completed, and a report is available for distribution, it will be listed as a "completed report."

- Whether the report resulting from the research project is available and the address where the completed report can be obtained.

To discuss research projects that are recent or ongoing, please call CMHC General Inquiries at (613) 748-2000 and ask for the CMHC Project Officer identified under each project description.

CMHC's External Research Program

The objective of the CMHC External Research Program (ERP) is to encourage and enable researchers in the private and not-for-profit sectors to put forward and carry out relevant, innovative, and high quality housing research projects. Under the Program, financial contributions are made to support research investigations into important questions, problems, and issues affecting Canadian housing. Housing research priority areas are identified in the "External Research Program Grants for Housing Research Guidelines and Application Form".

Applicants to the External Research Program must be Canadian citizens or have permanent resident status in Canada.

Independent researchers as well as those employed in Canadian universities, institutions, private consulting firms, the professions and the housing industry may apply for these grants.

Full-time students at the graduate or undergraduate level are not eligible to apply. Students may be hired to assist in the conduct of the research, but under no circumstances may they take over responsibility for the direction of the work or the quality of the final report.

Individuals who are full-time federal, provincial or municipal government employees may apply. However, to be eligible, an applicant must provide a letter of support from her/his employer which shows that the proposed research is not part of, and will not interfere with, her/his regular work. CMHC employees are not eligible to receive grants under this Program.

CMHC is interested in receiving applications on topics related to its housing research priority areas. New ideas and innovative approaches in these areas are welcome.

To obtain the booklet outlining the priority research areas, the guidelines and application form for the External Research Program you may contact:

The Administrator
CMHC External Research Program
Research Division
Canada Mortgage and Housing Corporation
700 Montreal Road, Room C7-307
Ottawa, Ontario
K1A 0P7

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NOTE TO INTERNATIONAL CLIENTS

The "*Current Housing Research*" cites research reports and priced publications. **Availability and place of ordering varies with the type of report.**

PRICED PUBLICATIONS

Publications with prices listed in the "*Current Housing Research*" are available for sale to international clients. Prices are payable in Canadian dollars. Orders can be placed and the exact price, with shipping and handling, can be obtained from the following address:

CMHC Information Products
P.O. Box 35005
Stn BRM B
Toronto, Ontario
M7Y 6E5
Tel.: 613-748-2003
Fax: 613-748-2016

RESEARCH REPORTS

Research reports are listed without a price in the "*Current Housing Research*". They are free to Canadian residents. However, to recover some of our distribution costs there is a fee to mail research reports to locations outside of Canada. The price for research reports mailed to destinations in the United States is \$10.00 for each report. The price for research reports mailed to destinations in other countries is \$15.00 for each report. Prices are payable in Canadian dollars. Research reports can be ordered from the address listed below:

Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367
Fax.: 613-748-4069
Internet: chic@cmhc-schl.gc.ca

TECHNICAL RESEARCH

FIRST NATIONS BUILDERS' TRAINING.

This project was developed in partnership with the Ontario First Nations Technical Services Corporation. The product was a set of technical training materials relevant for First Nations communities. The three day curriculum includes a trainer's manual and a participant handbook containing sections on building envelopes, mechanical systems, flooring, walls and roofs. As well, the curriculum contains leading edge information on wood heating, slab-on-grade and shallow frost-protected preserved wood foundations. The curriculum has been successfully used in several training sessions in Ontario and Saskatchewan.

CMHC Project Officer: Alain Croteau

CIDN: 1750 0300002

Division: Assisted Housing Division

STATUS: Completed

AVAILABILITY: Publication available in conjunction with training sessions.

SELF BUILD ABORIGINAL HOUSING USING BALEWALL CONSTRUCTION: CUMBERLAND HOUSE, SASKATCHEWAN: FINAL REPORT.

This initiative, undertaken in a remote aboriginal community in north-eastern Saskatchewan has developed an affordable housing model that can be replicated in this and other communities. It focused on testing the feasibility of balewall construction as a self-build construction technique that could be easily taught and applied. It also involves the development of a funding model in the form of a revolving loan fund.

The initiative has resulted in the creation of a home building and renovation co-operative, completion of a training program in self-building techniques and development of organizational and administrative skills. The pilot project was extended to two communities in northern Manitoba -- Sioux Valley and Lake Manitoba where two homes have been successfully constructed. Two additional homes are scheduled to start construction in Cumberland House in the spring of 1998.

Produced by the World Vision Aboriginal Council. Produced under the auspices of Homegrown Solutions Maison, a grant program funded by Canada Mortgage and Housing Corporation. Homegrown Solutions is a joint initiative of the Canadian Housing and Renewal Association, the Federation of Canadian Municipalities, the Cooperative Housing Federation of Canada; and the Canadian Home Builders' Association. Ottawa: CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE : Aussi disponible en français sous le titre : *Autoconstruction de logements en bottes de paix destinés aux Autochtones : Cumberland House (Saskatchewan).*

IMPACT ANALYSIS OF INDUSTRIAL NOISE ON SURROUNDING RESIDENTIAL SECTORS: A PICTURE OF THE SITUATION FOR THE BEAUCE AND QUEBEC AREAS.

The research project is aimed at describing the current situation regarding the impact of industrial noise, with the testing being performed in the Quebec and Beauce areas, two regions where there are many industrial parks adjacent to residential sectors.

CMHC Project Officer: Sandra Marshall

CIDN: 1845 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Jean-Gabriel Migneron, Université Laval
1636 Pavillon Félix-Antoine-Savard
Quebec, Quebec G1K 7P4

AVAILABILITY: Publication not yet available

SOUNDPROOFING PROCURED BY THE EXTERIOR WALLS OF RESIDENTIAL PROJECTS.

The purpose of this project is to determine the acoustical performance of the exterior walls that are most commonly used in the construction industry.

CMHC Project Officer: Ken Ruest

CIDN: 2016 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Michel Morin, MJM Conseillers en Acoustique Inc.
6555 chemin Côte-des-Neiges Road, Suite 440
Montreal, Quebec H3S 2A6

AVAILABILITY: Publication not yet available

BASEMENTS, FOUNDATIONS & CRAWLSPACES

BASEMENT WALLS THAT DRY.

Research has shown that finished basement walls, with chronic wetting, produce molds dangerous to human health. This research suggests that no basement with a history of dampness should be finished until the moisture problems are completely remedied. This approach however ignores the reality that few people will spend the several thousand dollars to fix what they perceive to be inconsequential leaks. This project will attempt to find quick-drying basement wall systems, in hopes of being able to recommend these systems for marginal basements. A variety of basement insulation systems are being tested in University of Alberta test huts in 1998. They have been subjected to a mid-wall leak and a 15 cm flood to measure the drainage and drying characteristics. Testing is complete. The University of Alberta is currently analyzing the data analysis and preparing a report.

CMHC Project Officer: Don Fugler

CIDN: 1797 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CRAWL SPACES: HOW TO AVOID MOISTURE AND SOIL GAS PROBLEMS.

A crawl space is a type of shallow foundation, usually with the floor at grade and with a low headroom, typically less than 4 feet. Crawl spaces are commonly used in areas where there is a high water table, or where services are shallow (as in milder climate zones). They can also be found where deep excavation is not needed to provide adequate structural support, where the frost line is shallow, or where ground conditions are inappropriate for full in-ground basements - for example where there is considerable bedrock near the surface.

Crawl spaces often do not get adequate inspections and there is a general lack of appreciation by the housing industry for the elements that make up an effective moisture control strategy.

Moisture-related problems occur in many crawl spaces despite the fact that building codes require vents. Crawl space moisture needs to be controlled because it can result in mold growth and decay in the crawl space lumber, if humidity levels are too high. Moisture from the crawl space can also move into the living area, or even into the attic, causing similar problems in these areas.

The connection of crawl space air to the rest of the house can be affected by the choice of heating and cooling systems. With a forced warm air heating system, the crawl space is usually linked to the rest of the house through the leaky ducts placed in the crawl space. This provides plenty of mixing of crawl space air with the rest of the house, so the moisture is dissipated throughout the house. In houses without forced air systems, the house interior is not affected as much, because there is less physical connection between the house and the crawl space. Houses with high levels of air leakiness will move crawl space air into the house regardless of the type of heating system.

Many problems found in crawl spaces are related to a misunderstanding of how crawl spaces work. The insulation, air and vapour barriers are typically not well integrated with the rest of the house. Many crawl spaces are built over an exposed dirt floor, rather than incorporating a ground cover, floor drain and perimeter drainage similar to a properly constructed basement.

Recent research has illustrated alternative crawl space construction techniques. Passive ventilation may often be unnecessary or ineffective. The purpose of this publication is to explain the latest understanding of crawl spaces, and how they should be built to avoid problems.

Prepared by Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE : Aussi disponible en français sous le titre : *Comment éviter les problèmes d'humidité et de gaz souterrains dans les vides sanitaires.*

IMPROVED BASEMENT PERFORMANCE.

Concerns have been expressed by a number of authorities about the quality of construction of new basements. Technical and cost issues pertaining to the overall performance of poured-in-place concrete basements will be examined. The Canadian Standards Association (CSA), with CMHC and industry support, will improve the standard CAN3-A438-M84: Concrete Construction for Housing and Small Buildings. This standard addresses requirements for poured-in-place concrete basements. Several task groups are working to update this standard.

CMHC Project Officer: Don Fugler

CIDN: 1259 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

LATERAL BRACING OF FOUNDATION WALLS.

The purpose of this project is to assess the adequacy of current concrete foundation wall details to resist lateral pressures of various backfill heights, and to develop a booklet containing cost-effective details for typical situations where additional support is required. The details will be certified by a structural engineer registered in the province of Alberta. The project and development of the booklet will be managed by the Alberta Home Builders' Association on behalf of the Alberta Housing Industry Technical Committee (AHITC). AHITC is an alliance of major organizations (builder associations, Alberta New Home Warranty Program, Municipal Authorities and CMHC) which serves as the technical forum for the residential sector in Alberta.

CMHC Project Officer: Darrel Smith

CIDN: 2039 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PERFORMANCE GUIDELINE DEVELOPMENT FOR BASEMENT SYSTEMS AND MATERIALS.

CMHC is a participant contributing research to this multi-disciplinary, multi-agency study led by the National Research Council identifying knowledge gaps in the performance of basement systems. Based on additional research, guidelines will be developed for design, construction and evaluation of basement materials and systems to ensure their durability and long-term performance. Test methods for evaluating the long-term performance of plastic foams and mineral fiber exterior basement wall insulations are being developed. These materials will then be monitored for field performance in demonstration projects. A guide to basement performance is also being drafted.

CMHC Project Officer: Don Fugler

CIDN: 1421 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BASEMENTS, FOUNDATIONS & CRAWLSPACES

SLIDE PRESENTATIONS ON TWO FOUNDATION TYPES AND TO MONITOR THE PERFORMANCE OF THE EXAMPLES OF THE TWO FOUNDATION SYSTEMS.

The purpose of this project is to undertake and complete the development of two slide presentations and the monitoring of two foundations over a one-year period.

CMHC Project Officer: Tom Kerwin

CIDN: 1813 030000

Division: Research Division

STATUS: Ongoing Project

BUILDING CODES & STANDARDS

THE FUTURE OF CANADIAN STANDARDS FOR RESIDENTIAL CONSTRUCTION.

The objective of this project is to build on the March/97 report of the Joint Task Force of the Canadian Commission on Building and Fire Codes/Provincial/Territorial Committee on Building Standards (PTCBS/CCBFC) by documenting recent changes in standards specifically related to the housing industry.

CMHC Project Officer: Doug Pollard

CIDN: 2027 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

BUILDING MATERIALS

ADJUST-A-FORM.

The objective of this project is to develop ideas for adjustable, reusable forms. Specifically the project includes the inception to the development of a specific product ready for marketing. The end result will be a product that saves builders time and material and therefore project costs.

CMHC Project Officer: Darrel Smith

CIDN: 1501 0200001

Division: Research Division, Housing Technology Incentives Program

STATUS: Ongoing Project

Grant Recipient: Raymax Construction Limited
1038 Lesperance Road
Tecumseh, Ontario, N8N 1W8

AVAILABILITY: Publication not yet available

BUILDING AND RENOVATING WITH SALVAGED MATERIALS: A REUSE WORKPLAN.

The objective of this project is to develop and test design procedures and specification guidelines in the form of a workplan by which design professionals and builders can effectively salvage and reuse materials in building projects including demolition and renovation or new construction at a residential scale.

CMHC Project Officer: Darrel Smith

CIDN: 2023 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Mark Poddubiuk, Pearl Poddubiuk Architects
995 Girouard
Montreal, Quebec H4A 3B9

AVAILABILITY: Publication not yet available

* NEW *

COMPRESSED EARTH BLOCK CONSTRUCTION.

Officially approve the material "earth", to allow architects, builders and self-builders to make use of earth construction.

CMHC Project Officer: Chris Yves

CIDN: 2004 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Ginette Dupuy-Gouin
5920 Louis-Hémon
Montreal, Quebec H2G 2K6

AVAILABILITY: Publication not yet available

* NEW *

INCREASING THE VOLUME OF USED BUILDING MATERIALS IN CANADIAN CONSTRUCTION: A REPORT TO ASSIST HOMEOWNERS, CONTRACTORS, BUILDING OFFICIALS AND OPERATORS OF USED BUILDING MATERIAL CENTRES IN CANADA.

The used building material industry has experienced rapid growth in North America over the last five years. Today, it encompasses private, for profit and private non-profit organizations involved in the reuse and recycle business. This report is based on an industry survey conducted by the Used Building Material Association (UBMA). Its purpose is to explore ways to increase deconstruction activity, specifically where it concerns the reuse of building materials. The report specifically highlights wood and wood-related materials, a type of inventory that appears to have the greatest potential for increased sales and supply. While many of the associations canvassed have recycling services as well, this report focuses on material reuse.

The survey found a number of issues that can influence the viability of the used building material market. Such issues include regulatory barriers, technical barriers, and marketplace barriers. On the positive side, effort is being spent on establishing links within the industry through use of the Internet. Information sources include company listings, government programs, and material exchange opportunities.

BUILDING MATERIALS

Prepared by Bob Sawatsky and Jennifer Corson. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Cate Soroczan. Ottawa: CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

INFORMATION ON DURABILITY AND SERVICE LIFE OF BUILDING ELEMENTS AND EQUIPMENT.

A Delphi project is being undertaken to collect information from property managers, property management firms and experts in differing fields such as ventilation systems, elevators, walls, parking garages, etc., to determine, from their experience, the service life of these elements. The Ontario Rent Control may use the results as a starting point on life expectancy information. The study may also provide data on building elements which in some cases would have low or high durability variances. Follow-up research could then be undertaken to investigate why those building elements have these high variances.

CMHC Project Officer: Ken Ruest

CIDN: 1915 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PERFORMANCE OF BOX BEAMS.

The objective of this project is to review the design specifications, production, assembly, and testing/monitoring criteria for box beams, and finalize the design and details of production and testing and monitoring protocol.

CMHC Project Officer: Glynis Kossatz

CIDN: 1176 0200001,
1348 0200001

Division: Research Division, Housing Technology Incentives Program

STATUS: Ongoing Project

Grant Recipient: Art Wloski
4133 Northcliffe Avenue
Montreal, Quebec, H4X 3L2

AVAILABILITY: Publication not yet available

BUILDING MATERIALS

RE-USE: INTEGRATION OF USED BUILDING MATERIALS INTO NEW CONSTRUCTION.

The objective of this project is to promote the practice of re-use of building materials as a viable approach in the 3Rs of sound environmental practice for the construction industry, presently including waste management through recycling and reduction. Research will address 4 main concerns: economic, environmental, legislative/practical and perceptual -- presently barriers to viability in practice.

CMHC Project Officer: Darrel Smith

CIDN: 1842 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Mark Poddubiuk, Pearl Poddubiuk Architects
995 Girouard, Montreal, Quebec, H4A 3B9

AVAILABILITY: Publication not yet available

VIRTUAL SAMPLE ROOM WEB SITE OF GREEN BUILDING MATERIALS.

The objective is to develop a web site which will serve as an on-line catalogue/sample room of building materials that provide low environmental impacts. It will serve anyone who is involved in the selection of the various building materials that go into residential buildings such as architects, builders, renovators, property managers, and homeowners. The site will contain pictures of the products, the evaluation matrix, and the manufacturers information. This is a multi-partnered project including Public Works and Government Services Canada, Department of National Defense, Natural Resources Canada, Rural Municipality of Waterloo, and Human Resources Development Canada. The site will be fully operational this Fall and can be visited at www.sampleroom.buygreen.com.

CMHC Project Officer: Darrel Smith

CIDN: 1986 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CONCRETE

DEVELOPMENT OF A NEW EDITION OF THE STANDARD FOR CONCRETE CONSTRUCTION FOR HOUSING AND SMALL BUILDINGS (CSA A438).

The purpose of this project is:

- ♦ to carry out a review of the literature pertaining to current failures of concrete in residential basements, specifically addressing the high incidence of foundation wall cracking and water penetration.
- ♦ to determine how the delivered ready-mix might be improved in crack-resistance and how on-site concreting practices might be remedied; and
- ♦ to bring standard A438 into line with the requirements of the 1994 edition of CSA 23.1 Standard Concrete Materials and Construction.

CMHC Project Officer: Don Fugler

CIDN: 1259 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available.

CONCRETE

INVESTIGATION AND REPAIR STRATEGIES FOR CONCRETE CONSTRUCTION AND CATALOGUE OF INNOVATIVE CONCRETE ASSESSMENT AND REPAIR TECHNOLOGIES.

The purpose of this project is to create a survey questionnaire on concrete assessment, repair and monitoring strategies and report on existing protocols regarding concrete problems in multi-unit residential buildings.

CMHC Project Officer: Silvio Plescia

CIDN: 1890 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

STANDARDIZATION OF CONCRETE REPAIR PROTOCOLS.

This project will research current assessment, monitoring and repair strategies for concrete repair. Existing protocols commonly used in the field as well as existing protocol guidelines assembled by various agencies (eg. CSA) will be catalogued. This research will provide consultants, contractors and building owners with available protocols and concrete repair strategies.

CMHC Project Officer: Cate Soroczan

CIDN: 1890 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CONSUMER PROTECTION

ISSUES PAPER ON LIABILITY IN HOUSE CONSTRUCTION.

The Canadian Home Builders Association (CHBA) has expressed a concern that, in housing construction, it is becoming less clear who is liable for specific aspects relating to the house. They also are concerned that, as a result of cutbacks, municipalities are not carrying out inspections to the extent they once did and may be losing the capacity to properly enforce building regulations. This joint project, co-funded by CMHC and CHBA and managed by CHBA, will produce a paper discussing the issue of liability in housing construction across Canada and identify who is and is not liable. It will serve as the basis for discussion on these issues and for further study. The National Research Council (NRC) will also be a participating partner as the agency responsible for code development. An initial draft has been prepared and the project was extended to include provincial consultations at CHBA's request. A revised draft report is being reviewed.

CMHC Project Officer: Susan Fisher

CIDN: 1920 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CONTAMINATED LANDS

DEMONSTRATION OF SAFE HOUSING ON LIGHTLY CONTAMINATED LANDS.

CMHC research into contaminated lands shows that some types of soil contaminants could be rendered innocuous through building design and operation. One example is heavy metals deep within the soil. If these pollutants can be avoided through design, the cost of land remediation could be greatly reduced. The project will include contaminant monitoring and the investigation of the predictive capabilities of site specific risk assessments.

CMHC Project Officer: Don Fugler

CIDN: 1946 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

DOORS AND WINDOWS

DESIGN OF DURABLE JOINTS BETWEEN THE WINDOWS AND THE ENVELOPE.

The objective of this project is to establish construction, parameter and calculation method concepts to improve the durability of joints between walls and windows.

CMHC Project Officer: Jacques Rousseau

CIDN: 1839 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient : Mario Petrone, Petrone Architecte
200-2545 Delorimier Street
Longueuil, Québec J4K 3P7

AVAILABILITY: Publication not yet available

INFLUENCE OF AIR INFILTRATION ON THE ENERGY EFFICIENCY OF RESIDENTIAL WINDOWS.

The objective of this project is to propose a new way of accounting for air infiltration in energy efficiency calculations for windows.

CMHC Project Officer: Ken Ruest

CIDN: 2002 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Michel Bernier
Department of Mechanical Engineering, École Polytechnique
P.O. Box 6079, Station CV
Montreal, Quebec H3C 3A7

AVAILABILITY: Publication not yet available

* NEW *

DOORS AND WINDOWS

RETROFIT AND REMEDIAL WORK ON EXISTING SLIDING DOORS AND WINDOWS.

The proposed research project aims at the development of practical solutions to the problems associated with the typically reduced performance of existing sliding windows and doors in terms of weather tightness, due primarily to wearing of materials.

CMHC Project Officer: Oliver Drerup and Ken Ruest

CIDN: 1834 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Mr. Jozef Zorko, Associate Architect, Desnoyers Mercure Inc.
3601 University
Montreal, Quebec, H3A 2B3

AVAILABILITY: Publication not yet available

ENERGY CONSERVATION

BUILDING ENERGY ESTIMATION METHOD BASED ON FUZZY LOGIC AND NEURON NETWORKS.

The objective of this project is to establish a rapid building energy estimation method based on fuzzy logic and neuron networks.

CMHC Project Officer: Sandra Marshall

CIDN: 1841 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Stanislaw Kajl, Université du Québec,
INRS - Urbanisation in Montréal
3465 Durocher Street
Montreal, Quebec H2X 2C6

AVAILABILITY: Publication not yet available.

CMHC EMPTIED HEAT, AIR AND MOISTURE TRANSPORT MODELLING PROGRAM.

The purpose of this project is to provide engineering services to upgrade the CMHC EMPTIED Program from a DOS to Windows environment and to compile the necessary weather data to allow the program to evaluate the performance of wall systems in major cities of the U.S.

CMHC Project Officer: Duncan Hill

CIDN: 1107 0300003

Division: Research Division

STATUS: Ongoing Project

COMMUNITY ENERGY SYSTEMS (CES).

This project, in partnership with the CES group at Natural Resources Canada (CANMET), was conceived to investigate optimization of building/CES infrastructure investment. A research contract has been awarded to develop guidelines on the design of residential building HVAC systems that would render them retrofit ready for CES or other sources of low temperature energy with particular attention given to its use in hydronic heating systems.

CMHC Project Officer: Peter Russell

CIDN: 1570 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

ENERGY EFFICIENCY CASE STUDIES OF MULTI-UNIT RESIDENTIAL BUILDINGS.

CMHC is in the process of documenting the application of energy efficiency measures in multi-unit residential buildings to be used as case studies. A trial case study of a housing co-operative in Ottawa is underway, to not only assess the strengths and weaknesses of the energy efficiency measures implemented, but also to identify what information can be disseminated to others in the building industry. Upon completion of the first case study, CMHC will be soliciting the housing industry for additional energy efficiency case studies. A compendium of case studies will be made available from CMHC. The case studies will also support the Energy Efficiency Opportunities Manual for Multi-Unit Residential Buildings that CMHC is in the process of developing.

CMHC Project Officer: Duncan Hill

CIDN: 1899 0200002-3

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

ENERGY EFFICIENCY OPPORTUNITIES MANUAL FOR MULTI-UNIT RESIDENTIAL BUILDINGS.

CMHC, in partnership with the Ontario Ministry of Municipal Affairs and Housing, is in the process of developing a manual that details energy efficiency measures for existing multi-unit residential buildings. The document will be based on one originally developed by the Ontario Ministry of Housing in the early 1980's. The new manual will offer proven, current energy efficiency measures for the building envelope, mechanical, electrical, and domestic hot water heating systems. A project steering committee consisting of members of the housing, utilities and government agencies has been formed to provide comment on the manual as it is developed. Publication of the manual is expected in 1998. The manual will be modularized and provided in such a format that will be easily updated over time.

CMHC Project Officer: Duncan Hill

CIDN: 1887 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

FIELD INVESTIGATION OF ENERGY IMPACT OF CORRIDOR AIR VENTILATION SYSTEMS.

A research project has been initiated to study the seasonal impact of the operation of corridor air ventilation systems in multi-unit residential buildings on heating season energy consumption. Traditionally, it was assumed that corridor air systems should be shut down during periods of low occupancy and/or occupant activity in order to reduce energy consumption. However, it is also suspected that shutting off a natural gas-fired corridor air system in an electrically heated building, may actually increase energy consumption. Both of the aforementioned assumptions are based on the theory that corridor air systems are capable of effective and efficient air delivery - which is now known to be incorrect. The research will attempt to determine the influence that the operation of corridor air systems within 4 buildings has on energy consumption. The systems will be cycled on and off over a sufficient period to allow for an analysis of trends in resultant energy consumption. This study will help to characterize the costs of operating corridor air systems and will also serve to identify energy efficiency strategies.

CMHC Project Officer: Duncan Hill

CIDN: 1934 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

FOUNDATION PAPER ON COMMUNITY ENERGY PLANNING.

Following the recent Kyoto summit on climate change, the federal government recently established fifteen "Issue/Sector Tables" to examine the costs and impacts of implementing Canada's greenhouse gas reduction targets. CMHC is a member of the "Municipalities Table" and co-chairs the subcommittee on "Community Energy Planning" (reporting to the Municipalities Table). CMHC recently funded the development of a Foundation Paper on Community Energy Planning to examine the potential energy savings and greenhouse gas emission reductions associated with integrated transportation and land-use planning, community energy systems (cogeneration, district heating, etc.), and other energy management options.

CMHC Project Officer: David D'Amour

CIDN: 2078 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

INTERNATIONAL ENERGY AGENCY (IEA) : ENERGY RELATED ENVIRONMENTAL IMPACT OF BUILDINGS.

This three-year project, scheduled to end in 1999, is an IEA activity in which 14 countries are collaborating in the development of life-cycle energy modeling. Information will be compiled and published on the methodology and life-cycle environmental impact data. Examples will be developed of how methods may be applied to different building types and sources of expertise; and the potential for extending the influence of the task directly into academia. CMHC is acting as the Operating Agency for this project.

CMHC Project Officer: Peter Russell

CIDN: 1629 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

LABORATORY TESTING OF DENSE PACK CELLULOSE FOR ATTIC INSULATION.

Some insulators claim that dense packing of cellulose insulation into hard to reach cavities (e.g. flat roof attics) prevents air movement along with providing insulation. Hydro Québec looked at the technique for upgrading attic insulation of flat roof housing, largely in Montreal. CMHC and the Société d'habitation du Québec (SHQ) also contributed funds to this project. The laboratory work took place in a two-storey environmental chamber at Concordia University. A flat roof attic was constructed in the chamber, set-up for monitoring, insulated with the dense pack cellulose method, and cycled through a seasonal change. The work is complete. CMHC will discuss with Hydro Québec ways of publishing the report or a condensation of its findings.

CMHC Project Officer: Don Fugler

CIDN: 1377 02010001,
1377 08010001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

OPTIMIZE: A METHOD FOR ESTIMATING THE LIFECYCLE ENERGY AND ENVIRONMENTAL IMPACT OF A HOUSE.

This computer program estimates the lifecycle energy requirements of a house as well as determining associated emissions. The program has been revised from a spreadsheet to a database to improve the instructions and user interface, and the computational speed. The application of the program is being expanded to include multiple, non part 9 national building code residential buildings by using Optimize to assess the lifecycle energy performance of the Conservation Co-op building in Ottawa. This exercise will also support the Green Building Challenge '98 and International Energy Agency (IEA) Annex 31 initiatives.

CMHC Project Officer: Peter Russell

CIDN: 0865 0201002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

A PHYSICAL CONDITION AND IAQ CHECKLIST FOR NRCAN'S ENERGUIDE FOR HOUSES RATING SYSTEM.

Natural Resources Canada (NRCan) and a number of industry stakeholders are in the process of developing a Canadian home energy efficiency rating system. The rating will be based on a visual evaluation of the house condition, a blower door test and energy data collection which will be analyzed using a computerized tool to identify the energy utilization of a new and/or existing home. The house will then be plotted on an energy utilization scale as it compares with performance criteria and assigned a numerical rating. The overall goal of this system is to reduce CO₂ emissions on the environment. This CMHC project involves the production of an evaluation "checklist" that will be used to assess the physical condition and indoor environment of a house. This checklist is complete and will be incorporated as part of NRCan's EnerGuide for Houses Program.

CMHC Project Officer: Darrel Smith/Terry Robinson

CIDN: 1922 0200001

Division: Research Division

STATUS: Completed; see
above

RE-INSULATING WITHOUT ANY CONDENSATION PROBLEMS - EFFECT OF ADDING INSULATION ON THE DISPERSAL OF EXFILTRATING AIR.

The objectives of this project are: 1. To test a method of characterizing air exfiltration, experimentally and analytically. 2. To determine the impact of two insulation strategies - from inside and from outside - on the dispersal of exfiltrating air through various types of joints.

CMHC Project Officer: Sandra Marshall

CIDN: 1853 200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Dominique Derome, Concordia University
1455 de Maisonneuve Blvd. West
Montreal, Quebec H3G 1M8

AVAILABILITY: Publication not yet available

RENTAL STOCK ENVELOPE SURVEY.

The STAR Database, used for modeling Canadian housing performance, requires data from a representative number of rental houses. This project will look at rental housing stock to see how it differs from owner-occupied stock and will examine how rental stock could be suitably sampled for inclusion in the STAR Database.

CMHC Project Officer: Don Fugler

CIDN: 1766 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SUPPORT FOR THE ENERNET STUDENT TRAINING NETWORK.

CMHC is contributing to a project by SIRICON using the Internet to educate students in 20 Québec high schools on the principles of building science and house energy auditing. The WEB site is now complete and schools are participating. The Spring 1998 interim report showed that there were few schools who could participate over the 1997/98 school year. SIRICON hopes to attract a bigger sample in the Fall of 1998.

CMHC Project Officer: Don Fugler

CIDN: 1822 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

ENERGY CONSERVATION

UPDATING THE AIRTIGHTNESS TESTING STANDARD.

The airtightness testing standard, Canadian General Standards Board (CGSB) 149.10, was published in 1986 and requires updating and simplification. CMHC has engaged CGSB and a contractor to undertake this work in 1998. A draft standard has been submitted to CMHC for review.

CMHC Project Officer: Don Fugler

CIDN: 1971 0200001,
1971 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

UPGRADE OF STAR DATABASE.

The STAR database contains characteristics and performance data on approximately 1000 Canadian houses. It is used as the basis for statistical examinations of Canadian housing stock, largely for energy modeling. A contractor consulted with agencies or groups to determine their need for this data. Most groups contacted were provincially or regionally based and stated that they did not need a national database. As the prime users will be CMHC, Natural Resources Canada (NRCan), and their contractors, there is no need to simplify the database form for other users. About 200 houses are currently being added into STAR in the Residential Energy & Economic Simulator (REES) spreadsheet format. There have been further additions from NRCan and about 35 Toronto houses from CMHC.

CMHC Project Officer: Don Fugler

CIDN: 1766 0300001

Division: Research Division

STATUS: Completed

AVAILABILITY: No report will be published

FIRES & FIRE PREVENTION

CLEANING UP YOUR HOUSE AFTER A FIRE.

This booklet, one of a series, will offer practical advice on what should be done to avoid health problems when moisture problems or calamities occur. After a fire there can be ongoing smoke and mold problems that can seriously affect the health of occupants. A point-form reference card, that is intended to be hung by the furnace, is also being written and will be available from fire departments.

CMHC Project Officer: Jim White

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

THE COSTS AND BENEFITS TO MUNICIPALITIES OF MANDATORY RESIDENTIAL FIRE SPRINKLERS.

This multi-year study is examining the financial impact on municipalities if all new housing was required to have fire sprinklers. A complementary study is assessing the change in life risk from fire. The work is being undertaken by Arencon Inc., Clayton Research Associates, and the National Fire Laboratories/NRC and is funded by CMHC, the Ontario Ministry of Municipal Affairs & Housing and the Office of the Ontario Fire Marshall.

The study uses a case study approach to assess the changes in costs and benefits that could occur if municipalities were to adopt mandatory sprinkler requirements for all new residential construction. There are six case study sites: Barrie and Burlington, Ontario; Pitt Meadows, B.C; Edmonton, Alberta; Kawacatoose First Nation, Saskatchewan; and Gatineau, Québec. The data collection, interviews with municipal and fire officials, economic and risk analysis are completed. The results were presented for review at a stakeholder forum and the final draft has been circulated to stakeholders for a final review. The report is expected to be available by the end of 1998.

CMHC Project Officer: Mark Holzman

CIDN: 1235 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INVESTIGATION OF SMOKE CONTROL IN HIGH-RISES BY POSITIVE PRESSURE VENTILATION.

A research project has been initiated to study the use of positive pressure ventilation (PPV) systems to contain and expel smoke from high-rise buildings during a fire emergency. PPV systems have been used in the U.S. in low-rise buildings. The system consists of a portable, high velocity fan which is used by the fire department to clear smoke from buildings in order to facilitate access to the fire and to aid in occupant evacuation. Preliminary studies have been conducted in multi-unit residential buildings but not in cold climates where stack effect may continue to dominate smoke movement. The research program is the result of a joint venture between CMHC, the City of Ottawa Fire Department and the Fire Laboratory of the Institute for Research in Construction of NRC. The ability of PPV to contain and clear smoke from exitways in high-rise buildings will be evaluated at the Fire Laboratory's full scale test building under both summer and winter conditions. If successful, PPV may offer Fire Departments an effective, low cost life and property saving tool.

CMHC Project Officer: Duncan Hill

CIDN: 1983 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

FIRES & FIRE PREVENTION

IT COULD NEVER HAPPEN TO ME, HIGH RISE FIRE SAFETY KIT.

This high rise fire safety kit consists of a videotape training program for use within the fire service; a videotape targeted to the general public; and public service announcements for radio and television promotion. Appropriate safety messages include proper evacuation procedures, the importance of insurance coverage, and residential prevention measures, such as smoke alarms, fire extinguishers and a family escape plan. This information is applicable to all people who live in high-rise buildings, but also to persons who visit or stay in high rise buildings for short periods of time, such as in hotels. CMHC was a partner in the development of these materials as part of a national high-rise fire safety education campaign.

CMHC Project Officer: Thomas Green

CIDN: 1610 0300

Division: Research Division

STATUS: Completed Project

AVAILABILITY: Carleton Productions International
P.O. Box 5069, Merivale Depot
1500 Merivale Road, 5th Floor
Ottawa, Ontario
K2C 3H3
Phone: (613) 224-9666

LEARN NOT TO BURN CURRICULUM FOR ABORIGINAL COMMUNITIES.

The purpose of this project is to modify the Learn Not to Burn curriculum, successfully developed and used by the U.S. National Fire Protection Agency (NFPA), for usage in Canadian First Nations communities. The Aboriginal curriculum has been developed by the Assembly of First Nations, with the assistance of the NFPA, the Aboriginal Firefighters' Association and CMHC, pilot tested in several First Nations classrooms, and will be available for K-2 modules in 1999.

CMHC Project Officer: Alain Croteau

CIDN: 1719 0300001

Division: Assisted Housing Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

FLOODS

THE JULY 1996 DISASTER IN THE SAGUENAY: THE EXPERIENCE OF REDEFINING A HABITAT.

The objective of this project is to understand and analyze the adaptation and integration mechanisms set up by families in rebuilding their homes following a natural disaster.

CMHC Project Officer: Marcel Boily, Chicoutimi Branch Office

CIDN: 1833 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Danielle Maltais, Université du Québec à Chicoutimi
555 de l'Université Blvd.
Chicoutimi, Quebec G7H 2B1

AVAILABILITY: Publication not yet available

HEATING & VENTILATION

ASSESSING THE ENERGY IMPACT OF VENTILATION AND INFILTRATION IN MULTI-UNIT RESIDENTIAL BUILDINGS.

The purpose of this project is to undertake a field investigation of the energy impact of corridor air systems in multi-unit residential buildings.

CMHC Project Officer: Duncan Hill

CIDN: 1934 0200004

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

EVALUATION OF RESIDENTIAL, IN-DUCT AIR FILTERS.

There are many residential air filters that have appeared in the last several years, providing an abundance of choice for consumers. Unfortunately, consumers have little objective information on the relative performance of these filters. This project is testing the performance of different filters, from disposable fiberglass to electrostatic precipitators, in houses. The contractor has looked at how air filtration affects the levels of particulates (dust) in housing, and at the production of ozone by electrostatic precipitators. Testing is complete in the six sample houses and data analysis is in progress. Twenty houses with existing electrostatic precipitators will also be sampled for indoor ozone concentrations in Summer/Fall of 1998.

CMHC Project Officer: Don Fugler

CIDN: 1620 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

FIELD SURVEY OF HEAT RECOVERY VENTILATION SYSTEMS.

This research assessed the ability of occupants to operate and maintain HRV systems and the effects of maintenance on system performance. It also evaluated the ventilation effectiveness of common HRV installation methods and several other innovative ventilation systems for new and retrofit installations. The project involved the inspection of 60 houses with heat recovery ventilation systems, a survey of the occupants to determine their understanding and usage of their ventilation systems, telephone surveys of a further 15 households and intensive performance testing of 20 conventional and four experimental ventilation systems.

The research concluded that common conventional approaches to HRV installation were capable of ventilating houses in an effective manner. The majority of the HRV systems inspected were used and the occupants believed that the use of the HRV system was beneficial. While most occupants understood the intent of the systems, few were fully aware of all of the considerations involved in the operation and maintenance of these relatively complex systems which was reflected in the condition of the HRV installations. The study found that considerable improvements are possible in installation practice, system performance, occupant understanding and interaction with their ventilation systems.

CMHC Project Officer: Duncan Hill

CIDN: 1376 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

FIELD TESTS OF VENTILATION SYSTEMS DESIGNED TO MEET 1995 NBC.

This study will deal with new houses designed and built to provincial or municipal codes that require the 1995 National Building Code. Ventilation requirements in recent Canadian building codes have become more complex and problematic to builders. The ventilation design needs to balance fresh air and exhausting air, and to consider house depressurization factors. CMHC publications such as "Complying with Residential Ventilation Requirements in the 1995 NBC" provide some help to contractors by giving examples of systems that should meet the requirements.

There may be more elegant or less expensive solutions currently being installed in the field. Conversely, contractors may be simply using heat recovery ventilators (HRVs) rather than trying to work out the compromises built into the standard to allow non-HRV systems. Because there is little or no compliance testing after construction, neither code officials or builders know whether the systems being installed actually function as designed. The research project will provide ventilation testing to contractors building to the 1995 NBC. The project will be advertised through the local home builder associations. The contractor would be required to supply system specifications, a record of actual system construction costs, and a house for testing. The research team would perform air testing on the house to verify its compliance with code required ventilation.

CMHC Project Officer: Don Fugler

CIDN: 2062 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

HVAC SYSTEMS OF MID AND HIGH-RISE RESIDENTIAL BUILDINGS.

An evaluation of the mechanical systems of 25 mid and high-rise residential buildings is being performed in order to determine the changes in design and installation practices required by the 1995 National Building and Energy Codes. Additionally, the performance of the mechanical ventilation systems will be assessed in 10 buildings in terms of design criteria, design procedures, system strategies and installed performance levels. This information will be used to produce advisory documents showing how to meet codes and improve system performance.

CMHC Project Officer: Duncan Hill

CIDN: 1424 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

IDENTIFYING AND REMOVING POLLUTANTS FROM HEAT RECOVERY VENTILATORS.

The objective of this project is to determine whether dedicated ventilation systems harbour unhealthy levels of dust, mould and/or fungi; whether existing duct cleaning methods are successful at lowering those levels; and to develop recommendations and guidelines for builders and homeowners for the maintenance of dedicated residential systems.

CMHC Project Officer: Don Fugler

CIDN: 1652 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Terry Watters
Rural Route #3, Comp 308
Wolfville, Nova Scotia, B0P 1X0

AVAILABILITY: Publication not yet available

INSPECTION OF DOMESTIC HEATING OIL TANKS.

The research covers work required to develop a practical, efficient and economical method of ascertaining the condition of functioning residential above ground oil storage tanks.

CMHC Project Officer: Darrel Smith

CIDN: 1829 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: William G. Moody, Moody Engineering Consultants
71 Newcastle Street
Dartmouth, Nova Scotia, B2Y 3M8

AVAILABILITY: Publication not yet available

LOW TEMPERATURE HYDRONIC HEATING SYSTEMS.

The objective of this project is to investigate low temperature hydronic systems (LTHS) as an energy option and identify additional information and action needed to assess, document, and appropriately advance LTHS.

CMHC Project Officer: Peter Russell

CIDN: 1570 0200001

Division: Research Division

STATUS: Ongoing Project

* NEW *

AVAILABILITY: Publication not yet available

MARKET VIABILITY OF INTEGRATED APPLIANCES IN CANADIAN MULTI-FAMILY MARKETS.

The purpose of this project is to provide financial support to establish a research consortium made up of members of the housing research community, utilities, manufacturers and suppliers of heating, ventilating and air-conditioning equipment and other relevant public and private agencies to research, analyse and report on the technical and market viability of integrated natural gas-fired appliances for multi-unit residential buildings.

CMHC Project Officer: Duncan Hill

CIDN: 2045 0200002

Division: Research Division

STATUS: Ongoing Project

* NEW *

AVAILABILITY: Publication not yet available

MONITORING A DUEL HEATING SYSTEM INSTALLATION.

This research will monitor and assess the performance of a dual fuel heating system in an 89 suite apartment building.

CMHC Project Officer: Duncan Hill

CIDN: 1899 0200004

Division: Research Division

STATUS: Ongoing Project

* NEW *

AVAILABILITY: Publication not yet available

HEATING & VENTILATION

PART-LOAD AND FROSTING CONTROL FOR ROTARY ENERGY WHEELS USED IN RESIDENTIAL BUILDINGS.

The objective of this research is to determine the performance of rotary energy wheels, also called enthalpy wheels, for ventilation air exchange in residential buildings while subjected to a wide range of operating conditions.

CMHC Project Officer: Duncan Hill

CIDN: 2007 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Robert W. Besant
Dept. of Mechanical Engineering, University of Saskatchewan
57 Campus Drive
Saskatoon, Saskatchewan S7N 5A9

AVAILABILITY: Publication not yet available

* NEW *

PERFORMANCE QUANTIFICATION ON SINGLE WELL HEAT PUMP.

The objective of this project is to quantify the performance of an existing open loop ground source heat pump system which uses a single domestic water well for both its supply and discharge requirements, and to demonstrate that a single well can be used as both the supply and discharge source for open loop ground water heat pump systems.

CMHC Project Officer: Chris Ives

CIDN: 1267 0200001

Division: Research Division, Housing Technology Incentives Program

STATUS: Ongoing Project

Grant Recipient: Bob Vasily and Associates
RR #1
Seeley's Bay, Ontario, K0H 2N0

AVAILABILITY: Publication not yet available

RESIDENTIAL MECHANICAL VENTILATION SEMINARS.

This is a partnership project between CMHC, HRAI and NRC. NRC will be responsible for the development of the material as well as the promotion and delivery of the seminars. HRAI will be the delivery agent. The objective is to develop and deliver a one day seminar on residential mechanical ventilation and the 1995 National Building Code requirements. It will cover the need for ventilation in relation to indoor air quality and the benefits that it will provide to the occupants. Common, affordable ventilation system options which satisfy the code requirements will be discussed in detail. Options will include systems that are coupled to ducted heating systems as well as those which are not. It will be targeted to builders and home inspectors. The seminar will be suitable for delivery in all provinces and territories which have adopted the 1995 NBC with delivery in major centres commencing June 1998.

CMHC Project Officer: Darrel Smith

CIDN: 1972 0200001

Division: Research Division

STATUS: Ongoing Project

HEATING & VENTILATION

RETROFITTING VENTILATION.

This project will look at how effectively ventilation can be retrofitted to existing houses, either as a standalone project or as part of a larger renovation. Many older houses need supplemental ventilation for specific reasons. A CMHC study in Quebec in 1994 showed that master bedrooms were under ventilated when the door was closed for privacy. In these electric baseboard houses, there was no specific provision of ventilation, and measured pollutant levels built up to excessive levels. CMHC has been offering advice on how to ventilate houses in various publications. Spot ventilation can be relatively easy, through the installation of bathroom or kitchen exhaust fans. However, retrofitting a ducted ventilation system for a central exhaust fan or a heat recovery ventilator can be a problem in a finished house, as ducting is hard to retrofit in plaster walls or drywall. The proposed research project will field test the effectiveness of retrofitted ventilation systems in older homes and their effects on indoor air quality. It will also describe practical methods for installing ventilation equipment and ducting in older homes.

CMHC Project Officer: Don Fugler

CIDN: 2063 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

VENTILATION AND HEATING SYSTEMS FOR NORTHERN CLIMATES.

In partnership with CHBA -Yukon and Yukon Housing Corporation, this first of a four phase three year project, will research the various ventilation and heating system options appropriate and acceptable for Northern climates. Field testing and monitoring their performance will also be conducted. This information will benefit the northern construction industry and may also be useful for increasing export potential of Canadian made ventilation systems.

CMHC Project Officer: Darrel Smith

CIDN: 2038 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

ADVISORY DOCUMENT ON MECHANICAL AND ELECTRICAL SYSTEMS IN MULTI-UNIT RESIDENTIAL BUILDINGS.

The technical report on the design of energy conserving equipment and systems providing plumbing, heating, ventilation and air conditioning, lighting and power in multiple-unit buildings has been reviewed by practitioners. The system design and installation practices noted in the report are being modified to reflect their comments. An advisory document to recommend "good engineering practice" for designers, owners and consultants should be available in late 1998.

CMHC Project Officer: Duncan Hill

CIDN: 1774 0300004, 5, 7

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BC MOISTURE PROBLEMS - COMPUTER SIMULATIONS.

This research will study the drying potential of various wall configurations and is intended to provide data to bolster recommendations to be incorporated in the Localized Best Practice Guide. The information will be prepared as a guide for construction practices in the Lower Mainland of British Columbia. As the cost of doing all the tests proposed may be prohibitive, it was recommended that computer simulation WALLDRY be used to determine which walls might be more promising to test than others, potentially leading to a reduction in the cost of the test program.

CMHC Project Officer: Jacques Rousseau

CIDN: 1816 0300004

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BC MOISTURE PROBLEMS - ENVELOPE DRYING RATES EXPERIMENT.

Findings from the 'Survey of Building Envelope Failures in the Coastal Climate of British Columbia' revealed that the construction of walls with face seal or concealed barrier systems does not promote rapid drying of wall assemblies once the moisture has saturated the moisture barrier and passed into the sheathing. The solution to promote drying of the wall assembly has been to introduce an air cavity behind the claddings. The objective of this project is to identify, through laboratory work, a range of cavity and vent configurations which will provide wall drying capability characteristics necessary to deal with the coastal British Columbia climate.

CMHC Project Officer: Jacques Rousseau

CIDN: 1816 0300009

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BC MOISTURE PROBLEMS - HYGROTHERMAL PERFORMANCE OF STUCCO.

The project objectives are to develop fundamental and applied understanding of the hygrothermal performance of stucco based wall systems for Vancouver, B.C. weather conditions. The properties will be investigated through laboratory evaluation. The long term hygrothermal behaviour of the building envelope components will be simulated using the LATENITE computer program. The result of the work will guide the "Envelope Drying Rate Analysis" study. The work is being collaboratively funded with the NRC/Institute for Research in Construction and is part of the recently launched Consortium on Moisture Control Strategies of Wall Systems.

CMHC Project Officer: Jacques Rousseau

CIDN: 1816 0300007

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BC MOISTURE PROBLEMS - LOCALIZED BEST PRACTICE GUIDES.

This project will produce supplements to the "Best Practice Guide for Wood Frame Building Envelopes" and the "Best Practice Guide for Flashings" specific to British Columbia coastal climate construction. The new document must deal with the conclusions, recommendations and the seventeen problem details identified in the "Survey of Building Envelope Failures in the Coastal Climate of British Columbia", November 1996 by Morrison Hershfield, for CMHC. This project has been undertaken in collaboration with the Building Envelope Research Consortium and the Canadian Wood Council. The reports will be published as national documents available through CMHC. The "Best Practices Guide for Envelopes in B.C." will be available in the Fall of 1998.

CMHC Project Officer: Jacques Rousseau

CIDN: 1816 0300003

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

B.C. MOISTURE PROBLEMS - QUALITY ASSURANCE PROTOCOL.

The objective of this study is to produce a locally relevant protocol which will form the baseline quality management system for the exterior envelope of 3 and 4 storey wood frame construction in British Columbia. The protocol deals with the conclusion and recommendations identified in the "Survey of Building Envelope Failure in the Coastal Climate of British Columbia". The protocol will also tie into the "Best Practice Guide for Wood Frame Construction in the Coastal Climate of British Columbia" which is currently under development. The draft protocol has been tested and requires improvements as a result.

CMHC Project Officer: Jacques Rousseau

CIDN: 1816 0300006

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BC MOISTURE PROBLEMS - SMALL SCALE TESTING AND DEVELOPMENT PROTOCOL.

This work results from the conclusions and recommendations of the "Survey of Building Failures in the Coastal Climate of British Columbia". The intent of this initial testing project is to give the industry some sense of what will or will not work and examine the sensitivity of the various systems to specific variables. The testing will provide a relative comparison under a specific set of environmental conditions. Although the work will not provide a definitive solution, it will serve to provide guidance regarding the use of some proposed new assemblies. The work will also develop protocol for the "Envelope Drying Rate Analysis" which is currently planned. The work is being funded in collaboration with the NRC/Institute for Research in Construction, the City of Vancouver, Van Maren Limited, Centreville Limited and Aquastap Limited.

CMHC Project Officer: Jacques Rousseau

CIDN: 1816 0300005

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BEST PRACTICE GUIDE: BUILDING ENVELOPE DESIGN FOR WOOD FRAME WALL ASSEMBLIES.

This "best practice" guide will present various exterior wall assemblies with wood frame construction. The document will contain construction details, specifications, sequence of construction and inspection/commissioning information. The document will be available in paper copy and on CD-ROM.

CMHC Project Officer: Sandra Marshall

CIDN: 1930 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BEST PRACTICE GUIDE - FIRE AND SOUND ASSEMBLIES FOR MULTI-FAMILY BUILDINGS.

This document, targeted at designers of multi-family buildings, will provide the latest information on CMHC research into fire and sound partitions, floors, flanking, plumbing noise, etc. The document is being produced in collaboration with the NRC/IRC.

CMHC Project Officer: Ken Ruest

CIDN: 1804 0300003

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BEST PRACTICE GUIDE: FLASHINGS.

This Guide and companion CD-ROM provides architects, engineers, designers and builders with a general understanding of the principles and best practices in design and construction on flashings. This 150 page Guide and companion CD-ROM includes information about materials and installations, controlling forces, directing water flow, surface tension and capillary action, and builder-designer checklists.

Prepared by Ashok Malhotra and Herb Otto. Ottawa: Canada Mortgage and Housing Corporation, 1998.

Order number: NE6919 ** Price: \$89.00 + GST and handling charges.

STATUS: Completed Report

AVAILABILITY: CMHC Information Products

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NOTE: Aussi disponible en français sous le titre: *Guide des règles de l'art: Solins.*

HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

CASE STUDIES FOR INNOVATIVE TECHNOLOGY AND SOLUTIONS IN SUCCESSFUL MULTI-FAMILY HOUSING.

Successful innovative Canadian multi-family residential buildings are being identified and documented for future monitoring. Areas such as durable building envelope, energy savings, life-cycle costs and environmentally responsive solutions will be evaluated. One multi-family residential building, the Conservation Co-operative, was selected for evaluation to be presented at the Green Building Challenge in Vancouver in the Fall of 1998. Posters of several Canadian residential projects are being prepared for the October GBC conference, as well.

CMHC Project Officer: Sandra Marshall

CIDN: 1817 0300001, 2

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CASE STUDY OF THE RENOVATION OF AN APARTMENT BUILDING WITH SOLID MASONRY WALLS.

A 90 year old commercial building with solid masonry walls has been gutted and renovated into a residential building for low income single persons. The renovation involved the addition of thermal insulation to the building envelope, the application of stucco to the exterior of three of the four sides of the building, restoration to the front masonry facade, installation of a balanced mechanical ventilation system and a combination hydronic baseboard/radiant floor heating system. The building envelope is being monitored to provide an indication of its potential long-term performance. Energy and water use and indoor air quality will also be monitored in the renovated building to assess the strengths and weaknesses of the renovation strategy. A case study will be produced to document the work undertaken and the results of the performance monitoring.

CMHC Project Officer: Duncan Hill

CIDN: 1730 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

COMPARATIVE ANALYSIS OF RESIDENTIAL CONSTRUCTION IN SEATTLE, WA AND VANCOUVER, B.C.

This research will focus on the comparative differences (if any) in construction and determine if a similar cause of building envelope failure is occurring in the typical low rise multi-unit (3 to 4 storey) wood framed residential development built in the Seattle area.

CMHC Project Officer: Jacques Rousseau

CIDN: 1569 0300003

Division: Research Division

STATUS: Ongoing Project

* NEW *

AVAILABILITY: Publication not yet available

COMPARTMENTALIZATION OF EXISTING HIGH RISE APARTMENT BUILDINGS: FINAL REPORT.

Morrison Hershfield evaluated the potential benefit of air sealing interior partition walls and floors as a method of air leakage control in an existing 15 storey apartment building. Data on the leakage characteristics of separating elements was obtained by field testing and data used to model the building with CONTAM94. The model was calibrated against measured pressure differences across exterior walls, partition walls and floors. Modelling runs with modified leakage characteristics of partition elements were carried out to evaluate potential reduction in air change due to sealing suite partition walls and doors. It was found that such measures did reduce stack driven air change but that the economic benefit was relatively small when considering the building as a whole.

Prepared by Mark Lawton, Morrison Hershfield. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Duncan Hill. Ottawa: CMHC, 1997. (External Research Program).

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

EFFECTIVENESS OF A CORROSION POTENTIAL METHOD FOR EVALUATING POST-TENSIONED TENDONS - AN EVALUATION REPORT.

The Institute for Research in Construction (IRC) of the National Research Council Canada (NRC) was recently requested by Canada Mortgage and Housing Corporation (CMHC) to evaluate some of the more promising techniques which claim to evaluate, repair or protect the condition of unbonded steel cables in post-tensioned building components. Three of the techniques, one evaluation and two protection, selected for this study, are owned by the same proponent. This report presents the evaluation of a corrosion potential method, a technique developed and marketed by the proponent to assess the state of unbonded tendons in post-tensioned concrete members.

The corrosion potential method estimates the probable extent of corrosion of unbonded tendons by a) measuring the moisture content of the air within tendon sheaths, b) correlating these measured conditions with the states of corrosion observed in a representative sample of tendons pulled from the member and c) estimating the corrosion condition of all tendons in the member using the derived relationship between moisture content and state of corrosion. Two approaches have been devised to implement the corrosion potential method:

1. The "Pilot Project Approach" is prescribed for members undergoing their first field evaluation. This approach limits expenditures by restricting testing to a small percentage of tendons, randomly selected from the member.
2. The "Full-Scale Testing" of all cables is recommended when previous tests have identified an extensive moisture/corrosion problem within the member.

The two approaches appear suitable for post-tensioned structures as they take into consideration the needs and resources of building owners.

Using the Full-Scale Testing Approach, field evaluation of the corrosion potential method was conducted on a floor slab in a building in Calgary, Alberta. Moisture contents were obtained by the proponent's personnel using hand-held tools and equipment and were classified using six grades of wetness developed by the proponent. The grades simplified the presentation and evaluation of moisture contents and their correlation with observed corrosion conditions.

The size and composition of the sample of tendons removed from the member is crucial to the statistical determination of cable corrosion conditions. The proponent has recommended that for "Full-Scale Testing" from 2% to 5% of the total tendon population be removed for correlation purposes. Based on tests conducted in Calgary, the authors suggest that the number of samples obtained by removing tendons be not less than 15 and that removed tendons closely reflect measured moisture conditions within the member.

The proponent used a system developed by Read Jones Christoffersen (RJC) of Calgary to visually grade the corrosion condition of removed tendons. The system appears well suited for the task but the rated levels of corrosion are examiner dependent. Correlating measured moisture conditions with corrosion conditions does yield a reasonable view of cable conditions with a member. The corrosion potential method can, therefore, be considered a practical technique for estimating the probable extent of corrosion of unbonded tendons provided representative tendons are selected for the correlation.

Prepared by G. Pernica and A.H. Rahman, Institute for Research in Construction, National Research Council Canada. Prepared for Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
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EFFECTIVENESS OF AN ACOUSTIC CONTINUOUS MONITORING SYSTEM FOR POST-TENSIONED BUILDINGS: AN EVALUATION REPORT.

The effectiveness of an acoustic continuous monitoring system in reporting the time and location of wire ruptures in unbonded post-tensioned tendons of buildings has been evaluated.

When installed in a structure containing unbonded post-tensioned tendons, the monitoring system picks up and records acoustic signals created by the rupture of a tendon wire and by other impact phenomena using an array of accelerometers, a pre-trigger device and an on-site, computer-based data acquisition system. Computer software, incorporating an artificial learning network, analyzes the recorded signals to identify and locate wire rupture events.

The system was evaluated by NRC/IRC in a post-tensioned building by cutting individual tendon wires and by intentionally producing other types of impacts on concrete members. Several months of data obtained from monitoring systems placed in two other buildings were also examined to evaluate the ability of the system to detect spontaneous tendon ruptures.

Based on this investigation, the acoustic monitoring system was considered effective in reporting the time and location of tendon ruptures in the monitored part of an unbonded post-tensioned building. Using the system to monitor the behaviour of a new building or an older building in which the existing condition of the tendons has been established by other techniques, can provide valuable information to assess the structural impact of tendon rupture at any time during the building's life.

It is recommended that the system be further developed to incorporate the capability of reporting the number of rupturing wires producing an acoustic event and to improve the reliability in locating the tendons in which the wire ruptures occurred. This additional information will help improve the accuracy of structural assessments and thus minimize the need for supplementary destructive field investigations.

Prepared by A.H. Rahman and G. Pernica, Institute for Research in Construction, National Research Council Canada. Prepared for Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1998.

STATUS: Completed Report

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EFFECTIVENESS OF AN ELECTROMAGNETIC WAVE PROPAGATION TECHNIQUE FOR THE CONDITION ASSESSMENT OF UNBONDED POST-TENSIONED TENDONS: AN EVALUATION REPORT.

The effectiveness of an Electromagnetic Wave Propagation Technique (EWPT) in detecting and locating defects in unbonded post-tensioned tendons and measuring the loss of cross-sectional area (LCA) at such defects has been evaluated.

The technique works on the principle that an electromagnetic pulse transmitted through a tendon from one of its ends is reflected from defects in the tendon such as corrosion pits and wire breaks. The distance of a defect from the transmitting end of the tendon is calculated from the arrival time of the reflection and its severity (depth and length) from the reflection's duration, amplitude and shape.

A protocol was prepared by the Institute for Research in Construction (IRC) of the National Research Council Canada (NRC) for the purpose of this evaluation. In accordance with the protocol, tests were conducted in three buildings in Calgary on a total of 86 tendons of various lengths and two sizes. The most important objectives of these tests were to determine the accuracy of defect detection and measurement of LCA, the influence of environmental factors such as water in the tendon sheath, nearby electrical fields and electrical contact with other tendons and metals, and the reproducibility of the technique's findings.

Tests showed that the technique is ineffective in detecting defects and measuring loss of cross-sectional area in unbonded post-tensioned tendons. The technique could not detect a majority of the defects, some as severe as completely broken cables. On the other hand, it reported a very large number of defects that did not exist. The technique appears to be influenced by the presence of electrical conduits near tendons and by electrical contact of tendons with metals although more testing is required to confirm this observation.

HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

The technique in its current state is therefore not recommended for assessing the condition of unbonded post-tensioned tendons.

Prepared by A.H. Rahman and G. Pernica, Institute for Research in Construction, National Research Council Canada. Prepared for Canada Mortgage and Housing Corporation, Ottawa, CMHC, 1997.

STATUS: Completed Report

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Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
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ENVIRONMENTAL IMPACT ASSESSMENT TOOLS FOR MULTI-UNIT HOUSING.

This project will assess 6 different environmental assessment tools to determine their applicability to multi unit residential buildings. The best features and limitations of each tool will be identified and transmitted to the authors of each tool. Four innovative buildings will then be assessed by one of the tools. This work will be presented to the Green Building Challenge '98 (GBC) Committee as part of CMHC's contribution to the development of the residential component of the Green Building Challenge overall evaluation criteria for buildings of all types. The GBC is an international conference on the performance assessment of buildings held in Vancouver October 1998.

CMHC Project Officer: Cate Soroczan

CIDN: 1872 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

ESTABLISHING THE FEASIBILITY AND FRAMEWORK FOR A MULTI-FAMILY HOUSING DATABASE.

CMHC performed a project to evaluate the feasibility of establishing a nationally representative multi-family housing database. Anticipated uses for such a database include, studies of the impact of energy retrofits on the energy consumed and pollutants emitted by multi-family housing. With an appropriate level of data, repair and replacement trends impacting on condition and resource requirements for this form of housing, could be identified. The study concluded that there was insufficient data available to define the population of multis in Canada in terms of age, size, construction and location. Additionally, the quantity and quality of existing data on actual buildings is insufficient to populate a truly representative database. The study recommended a number of paths that could be taken to establish a multi-unit residential building database both for the near- and long-term.

CMHC Project Officer: Duncan Hill

CIDN: 1805 0800001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

EXPORTING CMHC'S TECHNICAL SEMINAR SERIES.

Over the past fifteen years, CMHC has undertaken research work into the development of technologies for highrise buildings. The work could be marketable in the US and other countries where they are being faced with similar concerns regarding energy efficiency, airtightness, noise control and rain penetration control of the building envelope. CMHC's research activities into the building sciences were undertaken by Canadian consulting firms who have gained considerable knowledge that could also be marketed in other countries. A pilot series of seminars will be conducted in the USA in partnership with the Energy Efficient Building Association.

CMHC Project Officer: Ken Ruest

CIDN: 1928 0200

Division: Research Division

STATUS: Planned

AVAILABILITY: Publication not yet available

GOVERNOR'S ROAD AND SPENCER CREEK VILLAGE PROJECT, DUNDAS, ONTARIO.

The purpose of this project was to carry out the CMHC Healthy Housing and IDEAS Challenge objectives on the Governor's Road and Spencer Creek Village project in Dundas, Ontario.

CMHC Project Officer: Sandra Marshall

CIDN: 0840 0309007

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

GUIDELINES FOR THE RETROFIT OF UNINSULATED MASONRY WALLS.

In cooperation with NRC's Institute for Research in Construction, a project has been initiated to assess common forms of solid masonry walls in commercial and residential buildings and current energy retrofit strategies. Investigations of previously retrofitted walls are being performed to determine the impact on the durability of the building envelope.

CMHC Project Officer: Duncan Hill

CIDN: 1730 0300003

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

IDEAS HIGH-RISE CHALLENGE.

The IDEAS Challenge is intended to demonstrate the benefits of innovative design and technology in the operation of high-rise residential buildings. The Challenge focuses on five aspects of building design: envelope durability, energy efficiency, indoor air quality, environmental conservation and accessibility. One project in Montreal is built and monitoring is being carried out. Acoustic details have been tested. Two booklets are available, one that describes the IDEAS Challenge and the features of the five finalist projects and another which is a "Better Building" guide to innovation in the design and construction of high-rise residential buildings. The design process of a building in Dundas, Ontario which is exploring the adaptation of the IDEAS Challenge goals and details of CMHC's Best Practice Guide, is being documented. Projects in Victoria, Vancouver and Edmonton are also beginning.

CMHC Project Officer: Sandra Marshall

CIDN: 0840 0300

Division: Research Division

STATUS: Ongoing Project

MODELING OF AIR/MOISTURE MOVEMENT AND DURABILITY PERFORMANCE OF RESIDENTIAL AND COMMERCIAL BUILDINGS.

The purpose of this project is to develop knowledge to assess the impact of various wall designs, ventilation and indoor environment conditions on the durability and energy efficiency of new and retrofitted high-rise residential and commercial building systems.

CMHC Project Officer: Duncan Hill

CIDN: 1934 0200003

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

MONITORING INNOVATIVE MECHANICAL AND ELECTRICAL SYSTEMS.

The innovative mechanical and electrical energy consuming and producing systems in high-rise housing at a recently completed housing project in Peel, west of Toronto, are being monitored. A gas-fired cogeneration system was installed that provides electricity and thermal heat to the building. The building's owners are concerned that the system is not performing in an economically viable manner. An extensive monitoring and performance assessment is underway to evaluate system performance. The cost of energy provided to the building by the cogeneration system in terms of fuel consumption, maintenance expenditures, avoided utility invoicing and other considerations will be assessed. The performance and cost of the cogeneration system will be compared to other alternative but more conventional options.

CMHC Project Officer: Duncan Hill

CIDN: 1260 0800001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

MONITORING THE RETROFIT OF A RESIDENTIAL HIGH-RISE BUILDING ENVELOPE.

A case study of a 20 year old high-rise building in Toronto has been undertaken to document and monitor the performance of the retrofitted walls. In November 1997, an Exterior Insulating Finish System (EIFS) was installed over the precast block walls as part of an overall building renewal project. Instrumentation to monitor heat, air and moisture regimes within the wall sections was installed which is currently being monitored for one year to assess the performance of the retrofit strategy. Preliminary results indicate that the walls are performing in a satisfactory manner but an assessment of the full year's monitoring will be necessary.

CMHC Project Officer: Duncan Hill

CIDN: 1602 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

OPERATING AND MAINTENANCE BOOKS FOR MECHANICAL AND ELECTRICAL SYSTEMS IN MULTI-UNIT BUILDINGS.

Two publications, currently in 'draft' stage, on improving the operating performance of modern residential building systems have been developed. The first document, for owners and managers, links good operating practices with desirable investment strategies. The second, for building operating and maintenance staff, updates information on mechanical and electrical systems and incorporates preventative maintenance checklists for multi-unit residential buildings.

CMHC Project Officer: Jacques Rousseau

CIDN: 1774 0300004

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PERFORMANCE MONITORING: BRICK VENEER/STEEL STUD (BV/SS) WALL SYSTEM: PHASE 4.

Phase 4 of this study involves a fourth year (1997/98) of in-situ performance monitoring of a BV/SS wall system, with respect to air and moisture movements after the top vents in the brick veneer wall have been opened. The performance of a wall is being monitored using temperature, moisture and air pressure sensors connected to an automatic data logging system. Preliminary results indicate that the vent holes did not contribute to drying the wall but increased the moisture loading of the brick veneer. Even though the BV/SS wall system is typical of current practices and workmanship was satisfactory, the results of the study demonstrate that performance problems exist that may lead to significant distress over the long term. The more serious performance problems identified in this study are due to design weakness demonstrating the need to improve design and construction standards. Phase 1 & 2 reports are available from CMHC. The results of the Phase 3 research demonstrated no significant difference from Phase 1 and 2 and the Phase 4 draft report has been received.

CMHC Project Officer: Jacques Rousseau

CIDN: 0787 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RAIN CONTROL BEST PRACTICE GUIDE.

This document, currently in the 'draft' stage, provides the latest information on controlling the penetration of rain into walls. It is based on CMHC's research and other information regarding rain penetration control. The work is being funded in collaboration with the American Architectural Manufacturers Association.

CMHC Project Officer: Jacques Rousseau

CIDN: 1258 0300004

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RAINSCREEN 2.1 COMPUTER PROGRAM.

The RAINSCREEN program was developed to assist in the design of rainscreen pressure equalized wall assemblies. This project is aimed at producing a new version of the RAINSCREEN computer program, including a tutorial program and a manual that will be much more user-friendly. The work involves adapting the existing program to Windows and Mac environments and validating the program to laboratory test results to increase user confidence in the program. The BETA IBM version of Rainscreen 2.1 (English only) is available through e-mail (jroussea@cmhc-schl.gc.ca). The program is being updated to offer a better interface to determine the effects of the air barrier and cladding flexibility.

CMHC Project Officer: Jacques Rousseau

CIDN: 1258 0300005

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

REMEDIATION OF B.C. MOISTURE TROUBLED BUILDINGS.

This project will research and prepare diagnostics and recommended procedures for the cost effective remediation of leaking condominiums in the lower mainland of B.C. The project will develop a standard method of damage assessment, to develop a solutions tool which considers technical, code compliance, financial implications and practicality of repair. Two additional documents will result - one for property managers and another for strata councils - on maintenance and repair issues. A contractor will be selected in the Fall of 1998. The project duration is expected to be one year.

CMHC Project Officer: Ken Ruest

CIDN: 2061 0200

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

REPAIR AND RETROFIT CASE STUDIES FOR MULTI-UNIT RESIDENTIAL BUILDINGS

CMHC is documenting repair and retrofit activities in multi-unit residential buildings. The first 30 case studies will document building characteristics, the type of problems that prompted the repairs and retrofits, costs, benefits, etc. A wide range of case studies will be included to reflect regional repair and retrofit priorities. The studies will be useful for other members of the multi-unit residential building industry to refer to when considering similar projects. An information template that can be used as a guideline for the type of information that should be extracted from a repair or retrofit project in a multi-unit residential building has been developed. CMHC is currently soliciting the building industry for case studies and will retain consultants to provide the necessary documentation. A compendium of case studies will be assembled and made available to the members of the housing industry.

CMHC Project Officer: Duncan Hill

CIDN: 1782 0300001-7

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet

STUDY TO EVALUATE CAUSES OF MOISTURE PROBLEMS IN ALBERTA HOUSING.

In partnership with the Alberta Housing Technical Committee, this project would investigate the alleged problem of moisture ingress into low-rise wood frame housing in Alberta. At the present time, industry opinion is divided on the source of moisture critical to the cause of deterioration and this study will provide some clarity to the issue.

Project Officer: Ken Ruest and Halayna Tataryn

CIDN: 2066 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

TECHNICAL AUDIT OF APARTMENT BUILDINGS IN TORONTO.

A representative sample of 63 multifamily rental buildings in Toronto have been audited in order to determine their condition. The buildings were examined to determine their durability, and health and fire safety aspects, and the related repair costs. The project is a joint initiative with the City of Toronto. Preliminary results show the repair costs to be approximately \$580/unit/year, for ten years, not including regular maintenance or finishings. The results of this condition survey are presently being analyzed.

CMHC Project Officer: Sandra Marshall

CIDN: 1537 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

WIND-DRIVEN RAIN FOR THE GOVERNOR'S ROAD PROJECT.

Continuing previous research, this project explores the impact of cornice design in providing protection from wind-driven rain at the top of a multi-family building in Dundas, Ontario in order to better optimize the roof design.

CMHC Project Officer: Sandra Marshall

CIDN: 1123 0300013

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOME OWNERSHIP

A CANADIAN HOMEOWNER'S MANUAL.

This project responded to the information needs of the housing consumer and developed an owner's manual that is comprehensive and can be made specific to each house. The manual is of interest to homebuilders as a marketing and service tool and for reducing callbacks; and to the warranty programs as a means of conveying good house maintenance and operation practices to the home owner. A national advisory committee oversaw the evolution of the manual and ensured that the views and experience of builders and warranty programs were considered. Focus group testing was conducted first on the idea of the manual and subsequently on the completed draft version. Consumers were enthusiastic about the idea and praised the product. The final, formatted text of the manual is ready and the publication is scheduled for release in 1999.

CMHC Project Officer: Fanis Grammenos

CIDN: 1559 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSE CONSTRUCTION

APPLICATION OF STRUCTURAL STEEL TO SINGLE-FAMILY RESIDENTIAL CONSTRUCTION.

The objective of this project is to investigate the use of structural steel in single-family residential construction, and analyze its applicability to Canada, taking into account technical requirements, cost-effectiveness and sustainability.

CMHC Project Officer: Rob Duncan

CIDN: 1831 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Michel De Spot, Director, Node Engineering
2703 124B Street
Surrey, British Columbia, V4A 3N8

AVAILABILITY: Publication not yet available

BUILDING SOLUTIONS: A PROBLEM SOLVING GUIDE FOR BUILDERS AND RENOVATORS.

This publication was developed to assist builders in reducing the expense and aggravation of construction defects and call-backs. This helpful guide explains the likely causes of common construction problems and provides advice on how to prevent the problems from occurring and solutions to make the job go smoothly. Solutions to ... Improperly installed siding. Preserved wood foundations. Leaky and unsightly roofs. Nail pops on drywall. Cracked basement foundation walls. It's all here!

A must-have for those learning residential construction and a great refresher for builders, renovators and trades people. A good investment for self-builders too. It includes a handy glossary.

Features 6 Chapters: Building Foundations, Flooring Systems, Wall Systems, Roofing and Ceiling Systems, Indoor Air Quality and Ventilation Systems and Noise Control.

Ottawa: Canada Mortgage and Housing Corporation, 1998.

Order number: NE2004. ** Price: \$34.95 + GST and handling charges.

STATUS: Completed Report

AVAILABILITY: CMHC Information Products
P.O. Box 35005
Stn BRM B
Toronto, Ontario M7Y 6E5
1-800-668-2642
Fax orders from Canada: 1-800-245-9274
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre: *Solutions de construction: recueil de solutions à l'intention des constructeurs et rénovateurs.*

CSA Z-824 STANDARD.

The objective of this project is to take the existing draft of the CSA Z-824 Log Standard, rationalize the organization of the standard contents, and produce a draft for comment.

CMHC Project Officer: Rob Duncan

CIDN: 1811 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

DEVELOPMENT OF COMMERCIALLY VIABLE CONCEPTS AND A DESIGN FOR A RESIDENTIAL FRAMING SYSTEM FOR A MONOCOQUE HOUSE.

The purpose of this project is to undertake the development of commercially viable concepts and a design for a residential framing system for a monocoque house, to provide on-site guidance during the construction of prototypes of the design and to undertake post construction performance monitoring of the structures.

CMHC Project Officer: Rob Duncan

CIDN: 0657 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

EASY-ACCESS THRESHOLDS TO BALCONIES: PROBLEMS AND POSSIBLE SOLUTIONS

The objective of this project is to provide architects, builders, developers and regulatory agencies with a tool demonstrating the possibilities of producing easy-access thresholds to balconies in new or renovated residential buildings.

CMHC Project Officer: Sandra Marshall

CIDN: 1995 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Pierre Richard
4800 Marquette Street
Montreal, Quebec, H2J 3Y7

AVAILABILITY: Publication not yet available

LABOUR SHORTAGES IN RESIDENTIAL CONSTRUCTION.

The purpose of this project is to examine the available evidence concerning the extent of labour shortages in the residential construction industry; and document the overall labour supply situation in the residential construction industry.

CMHC Project Officer: Jamie Angus

CIDN: 1860 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RESIDENTIAL GUIDE TO EARTHQUAKE RESISTANCE.

This publication is intended as a reference guide for builders, renovators, architects, engineers, technologists, municipal officials, and other knowledgeable parties working with existing and new single family homes. It focuses on existing wood-frame homes but is also applicable to new construction. The information in the guide may be applied in all of the high risk areas in Canada (both coasts, the Montreal/Quebec City area, the Ottawa Valley, and some northern areas).

Order number: NE6995. ** Price: \$39.95 + GST and handling charges.

STATUS: Completed Report

AVAILABILITY: CMHC Information Products
P.O. Box 35005
Stn BRM B
Toronto, Ontario M7Y 6E5
1-800-668-2642
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International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre: *Guide d'améliorations de la résistance des habitations aux séismes.*

HOUSE CONSTRUCTION

STUDY OF SEAM TELEGRAPHING IN RESIDENTIAL FLOORING.

A CHBA led research project was conducted, in partnership with Macmillan Bloedel, the Canadian Plywood Association, the Canadian Particleboard Association, the Industrial Research Assistance Program of N.R.C. and CMHC. This research identified that the seam telegraphing problems in residential flooring currently being experienced by the housing industry are predominantly attributable to site conditions which lead to complex interactions between layers of materials. Of greater significance than that of material type, are the installation practices followed. Moisture problems, for a number of different reasons from material acclimation to construction material generated moisture (ie: floor slabs), are the main reason for this problem. A full report will be available from the CMHC Canadian Housing Information Centre and through other stakeholders in the Fall of 1998.

CMHC Project Officer: Darrel Smith

CIDN: 1729 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

"TALL WALL" CONSTRUCTION DETAILS.

The purpose of this project is to develop a series of cost-effective, common design and construction details, certified by a structural engineer registered in the province of Alberta, for typical "tall walls", such as walls exceeding the maximum height permitted by the building code. The project and development of the report/booklet will be managed by the Alberta Home Builders' Association on behalf of the Alberta Housing Industry Technical Committee (AHITC). AHITC is an alliance of major organizations (builder associations, Alberta New Home Warranty Program, Municipal Authorities and CMHC) which serves as the technical forum for the residential sector in Alberta. AHITC will be responsible for the production and the distribution of the booklet to their members.

CMHC Project Officer: Darrel Smith

CIDN: 2037 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSING DESIGN

AFFORDABLE, VERSATILE HOUSING.

This project identifies and describes house designs that enable a house to accommodate a range of household types, sizes and needs by means of their adaptability. It documents the features of designs that have been built and it explains their economic and use advantages. The set of designs to be included will cover all housing forms, from detached houses to apartments. This first guide on adaptable designs will be made available both in hard copy and electronic format via the Internet.

CMHC Project Officer: Fanis Grammenos

CIDN: 1783 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

DESIGNING FOR DISASSEMBLY.

The intent of this research is to examine ways in which homes can be designed to facilitate future renovation, thereby reducing the generation of wastes. Although the principles of deconstruction are gaining popularity by demonstrating that used building materials can be reused or recycled, its practice and cost-effectiveness is viewed largely with skepticism. The labour intensity of salvaging used building materials is primarily due to the way in which homes have traditionally been constructed. Essentially, traditional design and construction give no consideration to the eventuality of renovation. As a result assemblies, components and building systems are joined, fastened and connected in a manner which makes disassembly difficult and wasteful.

This research was aimed at small to mid-size homes (900 to 1,800 square feet), single family dwelling units situated on standard urban and suburban sized lots. The report analyzes typical foundation, floor, interior partition, exterior wall, and roof assemblies to determine the obstacles to disassembly which currently exist. Examining the obstacles helped direct the research towards analyzing ways in which each of the assemblies could be re-designed to serve that same purposes and maintain their structural and aesthetic integrity but facilitate future disassembly to accommodate less wasteful renovation and deconstruction. The heart of the research lay in determining better ways to connect materials and building components. Through the examination of traditional construction and design, the purpose was to develop a set of principles and designs which fulfill the concept of designing for disassembly.

Effort was concentrated in researching available products and technologies which lend themselves well to future renovation and deconstruction. To test the viability of the research, the new design principles were scrutinized on the basis of cost-effectiveness (conceptually comparing the principles to traditional construction methods), industry acceptance (designers, contractors and trades people were surveyed to gain feedback), and public acceptance (potential home buyers and home owners were also surveyed to gain feedback).

Prepared by Vince Catalli, by dEsign consultants. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Darrel R. Smith. Ottawa: CMHC, 1998. (External Research Program).

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

FLEXHOUSING DESIGN DEMONSTRATION PHASE.

In 1996 CMHC launched the FlexHousing Design Competition with an aim to encourage the housing industry to explore new design concepts that integrate adaptable features into new housing. The first demonstration house, designed by Award of Merit winner, Ron Wickman, was opened in Edmonton in October 1997. Additional demonstration houses to be opened in 1999 include one in St-Nicolas, Québec, designed by McGill University and FMV Developments, and one designed by Competition winner Nicholas Varias, which will be part of the Canadian Centre for Housing Technology in Ottawa.

CMHC Project Officer: Tom Parker

CIDN: 1389 0300

Division: Research Division

STATUS: Ongoing Project

SPROUT: INFILL HOUSING FOR YOUNG, MIDDLE-INCOME FAMILIES: CASE STUDY = LA MAISON ESPACE VIVANT : LOGEMENT INTERCALAIRE POUR JEUNES FAMILLES À REVENU MOYEN : ÉTUDE DE CAS.

In this demonstration project, an innovative home was built in Montreal to showcase how housing can be designed to change as the owners' needs for space change. It was the culmination of a long research and design process. In 1992, Montreal-based designer/builder Sevag Pogharian Design had approached Canada Mortgage and Housing Corporation's External Research Program with a proposal to examine new approaches to adaptable housing. The resulting 1994 report, *SPROUT: Designing Capacities for Incremental Change*, contained sketch plans for small, affordable detached and freehold townhomes with the capacity to grow up to three times their initial habitable area. Space and connections for potential expansions into the basement, attic and back yard would be built in during initial construction.

During this same time period, the City of Montreal was pursuing ways to encourage new housing downtown, and to revitalize its inner city areas. New development bylaws had been introduced into Montreal in the Fall of 1994, with an impact on infill projects. In addition, the Association provinciale des constructeurs d'habitations du Québec (APCHQ) wanted to publicize alternative designs and technologies in the housing sector. The three groups agreed that building an example of the "SPROUT" on an infill site would create media interest and allow the public and the housing industry to come and see these new ideas for themselves. It would also be an opportunity to test the flexibility of the City's new regulations, and help show how a small infill site could be transformed into desirable housing.

In the Fall of 1994, the designer/builder, Sevag Pogharian Design applied for an A.C.T. grant to: investigate possible sites; consider regulatory requirements and obtain any required zoning amendments; design the house, and publicize the project, including holding an open house. The house was built in an expanded form, so that visitors could see its potential final size and use. The scope of the project was expanded and it became the first EnviroHome in Quebec -- meeting a stringent set of requirements for energy efficiency, resource conservation and a healthy indoor environment. While these features added to the final project costs, they also widened media exposure and increased public and industry interest in the open house. The educational value of the project has been significant, and it appears to be helping stimulate interest in revitalization in its Montreal neighbourhood.

Affordability and Choice Today (A.C.T.) Demonstration Project Sevag Pogharian Design. Prepared by: Rowena E. Moyes. Prepared for Federation of Canadian Municipalities, Canadian Home Builders' Association, Canadian Housing and Renewal Association, Canada Mortgage and Housing Corporation. Ottawa: The Federation; The Associations; CMHC, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Bilingual/bilingue

TAP THE SUN: PASSIVE SOLAR TECHNIQUES AND HOME DESIGNS. SECOND EDITION.

This book covers all aspects to consider with respect to passive solar house designs and techniques: solar radiation, solar energy collection and window performance, heat storage and distribution, shading and summer comfort, window selection considerations, design integration and site planning, overheating. It also includes 20 sample house designs of three varieties: detached; semi-detached and townhomes.

The purpose of this book is to help make the best use of the sun's energy in a home. While much of the book contains information of interest to house designers and builders, homeowners will also find it valuable for its practical tips and as a primer on solar energy in general.

Includes a CD-ROM that contains the following:

- the Comfort Design Checker Software, an Excel-based program that estimates the appropriate window area for a planned house;
- the program's user manual;
- a database that lists window manufacturers and their product lines with all their specifications including data relevant to solar heat gain and heat loss;
- Healthy Housing files containing useful information on house design based on five Healthy Housing principles. These include images and graphic descriptions of CMHC's Healthy House in Toronto, which illustrates passive solar techniques in use;
- the *Tap the Sun: Passive solar Techniques and Home Designs* book itself, which will be fully searchable; and
- the house designs.

Text written by Leslie Jones of Leslie Jones Associates, with technical and editing assistance from Fanis Grammenos and Roger Henry. Jointly funded by Canada Mortgage and Housing Corporation and CANMET, Natural Resources Canada. Ottawa: CMHC, 1998.

Order number: NE2000. ** Price: \$39.95 + GST and handling charges.

STATUS: Completed Report

AVAILABILITY: CMHC Information Products
P.O. Box 35005
Stn BRM B
Toronto, Ontario M7Y 6E5
1-800-668-2642
Fax orders from Canada: 1-800-245-9274
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre: *Capter le soleil: techniques solaires passives et modèles de maisons.*

CURBING COCKROACHES THE LEAST-TOXIC WAY: A PRACTICAL GUIDE FOR THE CONTROL OF COCKROACHES IN HOUSES AND APARTMENT BUILDINGS.

This handbook is a resource manual for anyone who needs to understand and teach others how our homes and apartment buildings become infested with cockroaches; why pesticide spraying alone is not an effective remedy; and why the best solution - Integrated Pest Management (IPM) - is the least-toxic one. It provides the background information that community health workers, environmentalists, landlords, tenant association leaders, tenants and homeowners need to educate themselves and others about cockroach control. It offers hands-on, practical information on how to carry out an IPM program against cockroaches.

The handbook is divided into five parts:

- A Cockroach Crash Course;
- The Pesticide Treadmill;
- Cockroach Control the IPM Way;
- Using Pesticides; and
- Promoting IPM for Cockroach Control in Your Community.

Information Sources lists the publications used to produce this handbook. The Appendices provide promotional hand-out sheets and visual aids.

Prepared by: Linda Pim and Monica Campbell. Funded by Canada Mortgage and Housing Corporation and the Ontario Ministry of Environment. Ottawa: CMHC, 1998. 69 pages.

Order number: NE2047. ** Price: \$12.95 + GST and handling charges.

STATUS: Completed Report

AVAILABILITY: CMHC Information Products
P.O. Box 35005
Stn BRM B
Toronto, Ontario M7Y 6E5
1-800-668-2642
Fax orders from Canada: 1-800-245-9274
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre: *L'extermination des coquerelles de la façon la moins toxique.*

DEVELOPMENT OF MATERIAL EMISSION TEST STANDARDS.

Improved test standards for emissions from caulks and sealants and urethane foam are currently being developed. These standards, currently in draft, are now being considered within the American Society for Testing and Materials (ASTM) process. NRC/IRC has developed a draft emission test standard for VOCs from pressed wood products. Revisions are being made to these draft standards in response to an ASTM committee ballot and will be re-submitted again this year, using new CMHC support funding, as requested by the Task Force on Material Emissions. It is anticipated that the ballot will be passed for inclusion of these standards into the ASTM process in 1998.

CMHC Project Officer: Jim White

CIDN: 1244 0201003

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

EVALUATION OF POLLUTANT SOURCE STRENGTHS AND CONTROL STRATEGIES IN AN INNOVATIVE RESIDENTIAL HIGH-RISE BUILDING.

A research project was undertaken to examine the relationships between indoor air quality, building material pollutant emissions, and occupant activities in a multi-unit residential building. The main objectives of the study were to enhance the understanding of the relative contributions of building-related pollutant sources versus occupant related sources and to characterize the impact of source control and source dilution/venting strategies. The study determined that the concentration of volatile organic compounds (VOC) within the indoor air generally tended to decrease from the time of construction completion through to a period 8 months post-occupancy. Emissions from building materials and finishes dominate the overall emission loading within the apartments only during the pre- and immediate post-occupancy periods. Occupant-related pollutant sources such as furnishing, finishes and activities tend to dominate the overall pollutant concentration levels at later times. VOC concentrations in all apartments were found to exceed accepted guidelines. Formaldehyde emissions from building materials were the dominant source of total formaldehyde concentrations within the apartments for both the pre- and post-occupancy periods. Formaldehyde concentrations were generally below the Health Canada guidelines for new homes. Ventilation rates within the apartments did not appear to have a significant impact on indoor concentrations of volatile organic compounds and formaldehyde indicating that ventilation alone cannot be expected to control pollutant levels. Careful selection and use of low or non-polluting building materials would be a more appropriate means of optimizing indoor air quality. Furthermore, occupant education concerning their selection and use of low and non-polluting furnishings, finishes, cleaning compounds and other materials would be required to prevent occupant related sources from continuing to pollute the indoor air as the influence of building related materials decrease over time.

Prepared by SIRICON. SIRICON Project Manager: Dino Gerbasi. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Manager: Duncan Hill. Ottawa: CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

EVALUATION OF THE BARRHAVEN MULTI-UNIT HOUSING PROJECT FOR THE ENVIRONMENTALLY HYPERSENSITIVE.

This survey of the occupants and the landlord of a Barrhaven (Nepean, Ontario) housing project for the environmentally hypersensitive assessed whether the occupants' needs are being met and what advantages or limitations are encountered with this type of housing. For the most part, the occupants expressed satisfaction with their units. Lighting and aesthetics were considerations in addition to air quality which the occupants found very important. This study is helpful for others who are planning similar projects.

Prepared by the Flett Consulting Group Inc. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Virginia Salares. Ottawa: CMHC, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

FAREWELL TO COCKROACHES: GETTING RID OF COCKROACHES THE LEAST TOXIC WAY.

This publication describes the IPM - Integrated Pest Management - approach to controlling cockroaches or any insect. IPM is an approach that works, without using pesticides that can harm your health and your family's health. Homeowners, apartment dwellers, and property managers can follow the five step approach in the booklet to control cockroaches. *Farewell to Cockroaches* gives you the benefit of the knowledge and experience of health professionals so you can control cockroaches - or any insect pest - quickly and effectively.

Ottawa: Canada Mortgage and Housing Corporation, 1998. 25 pages.

Order number: NHA 2045

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE. Aussi disponible en français sous le titre : *Adieu coquerelles! Comment se débarrasser des coquerelles de la façon la moins toxique.*

A GUIDE TO MECHANICAL EQUIPMENT FOR CLEAN INDOOR ENVIRONMENTS.

Complementing the "Building Materials for the Environmentally Hypersensitive", this publication deals with heating, ventilating, air and water purification equipment. The document is a reference guide for selecting new mechanical equipment for new construction or retrofits. The document includes discussions of the applicability of the equipment to environmentally hypersensitive individuals. The guide will be available in the Fall of 1998.

CMHC Project Officer: Virginia Salares

CIDN: 1031 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HEALTHY MATERIALS, AN INTERNATIONAL COMMUNIQUÉ ON MATERIAL EMISSIONS.

This periodical, designed specifically for researchers (worldwide) on material emissions, is a communication vehicle on issues, progress, contacts and standards. It has been set-up on the Internet as a twice-yearly publication. Hard copies are also available from CMHC. Four issues are currently available, with two more expected in 1998.

CMHC Project Officer: Jim White

CIDN: 1244 0201

Division: Research Division

STATUS: Ongoing Project

INDOOR AIR POLLUTION FROM ATTACHED GARAGES.

CMHC is contributing to a Health Canada/Environment Canada project investigating the infiltration of garage-based pollutants into houses. Twenty-five Ottawa houses have been tested to determine the leakage area between the house and the attached garage. Pressure differentials were recorded and pressure testing was repeated during the winter months of 1997/98. The current work includes modelling of the IAQ implications and monitoring of pollutant entry when the garage is occupied by a "calibrated" car. Modelling is expected to be complete by September 1998. Further field testing will take place in the winter of 1998/99. A report on the garage airtightness testing is complete. CMHC is discussing with Health Canada how it will be released.

CMHC Project Officer: Don Fugler

CIDN: 1910 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INDOOR AIR QUALITY TRAINING PROGRAM.

A program to train indoor air quality problem inspectors has been developed and piloted. The program consists of a three-day course, followed by a field training phase. Pilot testing indicated that candidates for the program should have some expertise in building science and mechanical systems. A one-day "Let's Clear the Air" seminar has also been developed for other industry interest groups. This one-day seminar is a prerequisite to the three-day evaluators' course. Eleven trainees took the first three-day course and are going through the apprenticeship stage.

The 1998 schedule will include a new one-day field training session for building officials and public health inspectors in addition to the one-day seminars and the three-day course.

CMHC Project Officer: Virginia Salares

CIDN: 1623 0300017

Division: Research Division

STATUS: Ongoing Project

THE PRINCE EDWARD ISLAND BIRTH COHORT STUDY OF MOLD IN HOMES.

This joint study between CMHC, Agriculture Canada, Health Canada and others will ultimately look at several hundred homes in Prince Edward Island to determine the biological exposure, house performance parameters and energy use characteristics of a statistically-representative set of houses occupied by newborn babies. Part of the study will follow the health of these babies to determine the degree to which damp and moldy houses result in increased infant health problems. Ongoing sampling of the house biological matter will occur in a subset of the "good" and "bad" houses. The first year of the study has been completed. Indications are of a high incidence of health problems and high levels of moisture and mould in the houses. Data is being analyzed. Additional funding is being solicited for a second round of house and occupant tests.

CMHC Project Officer: Jim White

CIDN: 1618 0300001- 2

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RELIABLE METHODS FOR HEAT EXCHANGER LEAKAGE TESTING.

The goal of this project was to select, field test and demonstrate reliable and quantitative methods for furnace heat exchanger leakage testing. A survey was conducted on heat exchanger leakage test methods used by 40 Canadian and American utilities. This report is currently available from CMHC.

Research was also conducted on thirteen furnaces that had been "red-tagged" in the field. A test protocol was selected as being the most reliable for correctly predicting high levels of furnace heat exchanger leakage. The Canadian Gas Research Institute (CGRI), looked into variations upon this basic test, and found flaws in each test procedure. Additional test procedures were volunteered but did not prove more successful in the lab. If a more reliable test method is identified in the near future, it will be tested. However, in the research to date, no heat exchanger crack test method has shown itself to be worthy of promotion.

CMHC Project Officer: Don Fugler

CIDN: 1505 0200004

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SOIL GAS VOC INTRUSION RESEARCH.

CMHC is contributing to a multi-agency project which is looking at the rate and predictability of volatile organic compounds (VOC) into buildings located on contaminated soils. The contractors have reviewed the available models and are collecting data at a BC test site.

CMHC Project Officer: Don Fugler

CIDN: 1826 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Martin Adomait, President, Adomait Environmental Solutions Inc.
160 Cyprus Drive
Kitchener, Ontario, N2M 4R5

AVAILABILITY: Publication not yet available

INDOOR ENVIRONMENT

A STUDY OF HOUSE RETURN AIR SYSTEMS USING FLOOR JOIST SPACES.

Research was conducted on air in houses that is distributed through the ducting system consisting of supply ducts and a return air plenum. Floor joist spaces are being used as return plenums in new construction and this study characterizes the indoor air in a number of houses with return air plenums made of all metal, combinations of metal, solid wood, plywood or oriented strand board. A Research and Development Highlight sheet is being prepared.

CMHC Project Officer: Virginia Salares

CIDN: 1704 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

A STUDY ON THE EFFECT OF CONTROLLING THE HOME ENVIRONMENT ON ASTHMA.

Six houses having one or more individuals suffering from asthma and in which the occupant's symptoms are linked to the house were selected for further analysis. IAQ problems in these houses were evaluated and recommendations for remediation were provided to the homeowners. Toxic moulds were found in each of the six houses. Five of the homeowners proceeded with the remediation. Compliance with the recommendations varied from partial to full. Monitoring is currently being performed on the houses after the remediation. The health status of the asthmatic occupant will be followed by their physicians. This research is the first of its kind that studies the correlation between asthma and improvements to the air quality in the home.

CMHC Project Officer: Virginia Salares

CIDN: 1621 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SUPPORT FOR THE CONSORTIUM FOR MATERIAL EMISSIONS AND INDOOR AIR QUALITY MODELLING.

CMHC is an active supporting member on the steering committee and technical committee of a consortium established by the National Research Council, Institute for Research in Construction to develop protocols for testing materials and furnishings and for modeling the impact of those emissions on indoor air quality. Funds are being used to increase the database of materials tested to the new standards, in a house being built on the NRC campus.

CMHC Project Officer: Jim White

CIDN: 1244 0200004

Division: Research Division

STATUS: Ongoing Project

INDOOR ENVIRONMENT

TASK FORCE ON MATERIAL EMISSIONS.

This Task Force meets twice annually to discuss issues related to chemical emissions from building materials and to help direct Canadian efforts in this field, including prioritizing future activities. During a previous meeting held in the fall of 1995, three jointly-funded projects were approved. The draft final report, "Round-Robin Testing of Volatile Organic Compounds (VOC) Emissions from Common Building Materials" has been received. The final report is expected to be completed and available in May 1998.

The final of the paint report, "A Review of VOC Emissions and Drying Mechanisms for Interior Paints and Coatings" and the odour study, "Material Odour Emission Test Methods: Review and Evaluation" are available from CMHC's Canadian Housing Information Center. Seven additional resolutions concerning material emissions and health and future research were adopted by the Task Force during a January 1998 meeting. They also recommended setting up a Working Group on IAQ and health. Interested parties are solicited.

CMHC Project Officer: Jim White

CIDN: 1894 0300001
1244 0201008

Division: Research Division

STATUS: Ongoing Project

LIGHTING

TESTING THE ADEQUACY OF RESIDENTIAL LIGHTING IN A CARE CENTRE: NEW AGE-ADJUSTED NORTH AMERICAN ILLUMINATION STANDARDS.

The objective of this research is to undertake a field study on the effectiveness of lighting in two residential centres with remarkably different lighting levels.

CMHC Project Officer: Virginia Salares

CIDN: 2020 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Dr. Doris L. Milke
The Capital Care Group, McConnell Place North
9113-144 Avenue
Edmonton, Alberta T5E 6K2

* NEW *

MANUFACTURED HOUSING

COMPARISON OF THE NATIONAL BUILDING CODE, CAN/CSA-Z240 MH AND HUD PART 3280 MOBILE HOMES.

In Canada, mobile homes are usually built to the CAN/CSA-Z240 MH standard. (Z240). The National Building Code. (NBC). forms the basis for regulating all site-built housing. In the United States, the mobile home industry operates under the Housing and Urban Development (HUD) code. The MHI of Canada (MHIC) has suggested that there may be situations where the NBC and its provincial equivalents or the Z240 standard have more stringent requirements than are required for occupant health and safety. MHIC also believes that

MANUFACTURED HOUSING

there may be other approaches to the construction of housing that will deliver an equivalent unit of housing but at a reduced cost. CMHC, in association with MHI Canada and the Canadian Manufactured Housing Institute (CMHI), is undertaking a comparative study of practices under the three different approaches to examine if there are non-health and safety related code/standard differences that affect production costs. The study also addresses land use, sensitivity to product costs, assembly methodologies, distribution systems and other issues that affect the overall market penetration of manufactured homes in Canada.

CMHC Project Officer: Doug Pollard

CIDN: 1939 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

OPTIMUM VALUE ENGINEERING STUDY OF THE CANADIAN MANUFACTURED HOUSING INDUSTRY.

The Canadian Manufactured Housing Institute (CMHI), with CMHC, undertook an Optimum Value Engineering (OVE) study to examine the product engineering and manufacturing processes of the Canadian manufactured housing industry. Phase I of the project comprised literature reviews of international advances in manufactured housing, site visits to US and Canadian plants and an industry survey questionnaire. Among the important findings are the significantly expanded role for computers in the industry and the lack of use of foam adhesives in Canadian manufactured housing. Reports from Phase I can be obtained from the CMHI. Phase II began in August 1997 and undertook further studies of the potential for use of foamed adhesive to attach interior finish materials to framing, and less material-intensive floor-framing details that retain the necessary structural properties. Phase II is now complete. Contact the CMHI for information.

CMHC Project Officer: Ken Rauch

CIDN: 1597 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

VIDEO: THE FUTURE OF MANUFACTURED HOUSING: ZONING AND PLANNING ISSUES.

Manufactured housing, as an industry, has long suffered from the stereotypical view of the "trailer park" as typified in old American movies. The modern day mobile or modular home, and the typical community within which it is located are a far cry from these old trailer parks. Manufactured housing can be a very viable and affordable alternative to site-built housing. However, developers often have a problem getting planning or zoning approval for new developments. This project documents the contemporary manufactured home community from various points of view. On site footage of recent Canadian projects and homes combined with resident, politician, planning official, developer and financier interviews give a comprehensive picture of how manufactured home communities can complement existing municipalities.

CMHC Project Officer: Doug Pollard

CIDN: 1948 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Video not yet available

 : See the following other studies on manufactured housing:

page 92 "Building a Model for Affordable Home Ownership"

page 108 "Export Performance and Needs of the Canadian Manufactured Housing Industry"

page 109 "Opportunities for Canadian Factory Built Housing in the Southeastern United States"

B.C. MOISTURE PROBLEMS - PHASE II.

Over the past 12 months CMHC has conducted research which has been instrumental in leading an industry wide consortium in the development of solutions to technical problems associated with wood frame apartment building envelope construction in the coastal areas of BC. The first part of the program, a field survey, has now been completed and has confirmed that the problem is likely attributed to incorrect wall design and construction, leading to ingress of exterior moisture followed by inadequate drying rates. Two steering committees are being formed from the Building Envelope Research Consortium's membership. The project will involve retaining the services of consultants to test and monitor new details and wall constructions; to adapt the two currently available Best Practice Guides for wood frame building envelopes and flashings for the coastal region of British Columbia; to develop a Quality Assurance Protocol which would be specific to the wood frame industry envelope design and construction process; and to develop a training program in partnership with the CHBA and the AIBC.

CMHC Project Officer: Jacques Rousseau

CIDN: 1816 0300006-8

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BASEMENT WALLS THAT DRY.

Research has shown that finished basement walls, with chronic wetting, produce molds dangerous to human health. This research suggests that no basement with a history of dampness should be finished until the moisture problems are completely remedied. This approach however ignores the reality that few people will spend the several thousand dollars to fix what they perceive to be inconsequential leaks. This project will attempt to find quick-drying basement wall systems, in hopes of being able to recommend these systems for marginal basements. A variety of basement insulation systems are being tested in University of Alberta test huts in 1998. They have been subjected to a mid-wall leak and a 15 cm flood to measure the drainage and drying characteristics. Testing is complete. The University of Alberta is currently analyzing the data analysis and preparing a report.

CMHC Project Officer: Don Fugler

CIDN: 1797 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

FIELD TESTING OF MOISTURE IN STRAW BALE HOUSES.

Straw bale construction is an innovative construction technique that is gaining popularity, particularly for rural houses. While these structures seem to be working well in the dry American southwest, the birthplace of the straw bale housing movement, it is unclear how well they will withstand extended periods of cold and damp conditions. This initiative is funding three small local investigations of straw bale house moisture content: one in several houses in Alberta/BC, one in older straw bale homes in the Gatineau area north of Hull, Québec and one in several houses in Nova Scotia.

The Quebec investigation is completed and a report is available. The older straw structures were showing signs of straw rot where the straw was not adequately protected from soil-based moisture. Data is being collected from the Nova Scotia and Alberta houses and added to the information collected from other straw

MOISTURE & MOLD

bale houses that are participating in an informal, international, cooperative monitoring project. Several of the houses showed high levels of straw moisture, particularly when probes were located near the exterior walls. Further monitoring and analysis is necessary to determine whether these occurrences will jeopardize the longevity of the straw.

CMHC Project Officer: Don Fugler

CIDN: 1867 0300002,
1867 0300004

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: See above

GUIDANCE DOCUMENT ON RESIDENTIAL DRAIN TILE INSTALLATION AND MAINTENANCE.

The Center for Drainage Studies at McGill University, Montréal, Québec, drafted a publication on the installation and maintenance of drain tile around the foundation perimeter of Canadian houses. McGill surveyed contractors across the country to ascertain regional patterns of drain tile installation and failure. The publication will not be issued immediately as it may be modified as a result of further drainage research being conducted by the multi-agency basement committee.

Project Officer: Don Fugler

CIDN: 1797 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

METHODS FOR THE REMOVAL OF EXCESSIVE ICE BUILD-UP ON FLAT OR SLOPED ROOFS.

This project studied safe and effective methods for de-icing flat or sloped roofs used in Montreal, especially after the freezing rain ice build-up in eastern Canada in January 1998. Salts, heating cables, plastic tents, hot water, steam, and other methods were used to remove ice from flat and sloped roofs. Generally, the most effective methods for a homeowner to use involved putting heating cables on the roof. Some of the de-icing salts were also useful. An "About Your House" factsheet for the public, based on the research findings, is currently being prepared.

CMHC Project Officer: Don Fugler

CIDN: 2025 0200003

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PERFORMANCE EVALUATION OF WATER REPELLENTS FOR ABOVE GRADE MASONRY.

The objective of this project is to evaluate the performance of various water repellents for above grade masonry on a comparative basis and develop practical methods to evaluate their effectiveness. This evaluation will be based on lab analysis and field testing as well as a literature review to find available information on water repellent performance. The initial part of this study, Phase I will be conducted under the CMHC External Research Program and will examine the issue of water infiltration while Phase II will examine exfiltration.

CMHC Project Officer: Jacques Rousseau

CIDN: 1696 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PREVENTING MOISTURE AND MOLD PROBLEMS IN YOUR HOME; CONSUMER'S BROCHURE.

This handout will advise consumers: a) how to hire a competent clean-up contractor; b) how to hire a moisture problem renovation contractor; and, c) what they must do to prevent future mold problems once a clean-up (and renovation) has been performed on their home. It covers occupant habits, maintenance, keeping indoor surfaces warm, use of ventilation systems, etc.

CMHC Project Officer: Jim White

CIDN: 1030 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PROTECTING GYPSUM SHEATHING IN INSULATED STEEL STUD WALLS.

A potential loss of strength and the growth of mould and mildew are two of the problems resulting from moisture accumulation in exterior gypsum sheathing. The purpose of this research was to examine methods of protecting various insulated steel stud and exterior gypsum wall systems when exposed to condensation conditions. To fulfil this purpose, eighteen different wall panels were exposed to laboratory-controlled, freezing and non-freezing temperatures and 100% relative humidity conditions at the exterior gypsum sheathing surface. The test panels varied according to the type of warm-side protection on the gypsum sheathing (unprotected, SBPO, or polyethylene) and according to six different assemblies of cold-side materials. Numerical analyses were carried out using a finite difference package to assist in determining the necessary test duration by finding the time required for the gypsum sheathing to approach a steady-state moisture condition.

The results from the test panels were compared on the basis of moisture content and percentage moisture distribution in each wall component. The final moisture content of the gypsum sheathing in each test showed that SBPO and polyethylene are very effective at reducing the amount of moisture absorbed by the gypsum sheathing. Polyethylene was the most effective at reducing the amount of moisture accumulating in the sheathing, as well as reducing the amount of moisture diffusing through the wall. Theoretical test panel results from numerical analyses compared favourably with the laboratory test results.

The use of protective barriers resulted in the accumulation of moisture in the warm-side batt insulation. Under freezing conditions, a layer of ice formed on the warm side of the gypsum. During non-freezing tests, most of the moisture was either absorbed by the sheathing (unprotected panels) or accumulated in the warm-side insulation. Thus, the use of protective layers in practice will require the development of designs which allow for the removal of this accumulated moisture.

MOISTURE & MOLD

The results of preliminary field trials of two full-scale walls are also included in the report. Two wall samples, one unprotected and one SBPO protected, were exposed to actual weather conditions on their exterior face from November 1994 to February 1995 in Calgary, Alberta. Two-dimensional heat flow in a vertical cavity and gaps between the protective layer and gypsum sheathing may have affected the amount and location of moisture accumulation in the wall samples. Generally, results from the full-scale field tests were not as promising as the laboratory and theoretical studies. The moisture content in the SBPO protected gypsum sheathing was higher than expected, and occasionally approached the moisture content values of the unprotected gypsum sheathing.

It is clear that SBPO and polyethylene can be used to protect exterior gypsum sheathing from moisture. The use of protective layers can improve wall performance when condensation, due to either air leakage or diffusion, occurs at the exterior gypsum sheathing. However, further work is necessary to find ways to efficiently remove water which may accumulate in the stud cavity under severe exposure conditions.

Prepared by K.D. Pressnail ... et al. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Manager: Jacques Rousseau. Ottawa: CMHC, 1997 (External Research Program).

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
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Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

RAIN PENETRATION CONTROL SEMINAR.

Water penetration is a frequent, recurring problem for building owners, leading to damage of building components, interior finishes and building contents. It frequently leads to high repair costs and possible litigation. Over the past few years, research undertaken by CMHC, has contributed to the understanding and the prevention of rain penetration. In particular the pressure-equalized rainscreen has been applied and refined. In this seminar the causes of rain penetration will be examined. The results of CMHC research will be presented, along with design features and practical details, which will help prevent rain penetration in a variety of wall types. This full day seminar is targeted to architects, engineers, specifiers, builders, developers and building owners concerned about rain penetration and how to prevent it. The seminars will be presented in Toronto, Winnipeg, Edmonton, Vancouver, Montreal and Quebec City. This seminar was developed in cooperation with the Canadian Masonry Association, the Canadian Precast Concrete Institute and the Exterior Insulated Finish Systems (EIFS), curtain wall and steel manufacturers.

CMHC Project Officer: Jacques Rousseau

CIDN: 0838 0303005

Division: Research Division

STATUS: Ongoing Project

RE-INSULATION OF EXISTING FLAT-ROOF MULTI-FAMILY BUILDINGS IN QUÉBEC.

A joint project with Hydro Québec to examine ways of re-insulating low-rise multi-family buildings for energy efficiency, without causing moisture problems in the attic. Field testing was complete in early summer 1997. A final report has been submitted. CMHC is discussing with Hydro Québec on the best way to disseminate the results.

CMHC Project Officer: Don Fugler

CIDN: 1377 0801001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SOLVING MOISTURE PROBLEMS IN A HOME: A RENOVATOR'S GUIDE.

This guide for renovators includes renovation solutions required in moisture troubled houses to prevent the recurrence of moisture and related mold problems. Included in the guide will be sections on water entry control, insulation, ventilation and plumbing/piping tips relevant to Canadian housing, as well as information from the draft document, "Modifying Your House So It Won't Grow Mold." It is being reviewed and release is expected in the Winter of 1999.

CMHC Project Officer: Jim White

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

A STUDY OF RECURRING MOLD PROBLEMS ON THE ROSEAU RIVER RESERVE, MANITOBA.

The Roseau River Anishinabe First Nation Reserve in southern Manitoba was evacuated from April 23, 1997 to May 22, 1997 due to flooding of the Red River. Although most of the 204 homes are surrounded by a dike, some flooding did occur. That flooding was almost exclusively limited to basement seepage below grade, along with some sewage back-up. Although the basements were cleaned and, in some cases, renovated, recurring mold continues to be a problem. Of more than 114 homes that were flood damaged, at least 34 have been identified as contaminated with *Stachybotrys chartarum* (also known as *Stachybotrys atra*), a dangerous mold. At least 53 other homes have been identified as contaminated with various other molds.

The purpose of this report was to investigate the recurring mold problems at the Roseau River Reserve through a sample study of eight homes both inside and outside the dike, using the Canada Mortgage and Housing Corporation *Indoor Air Quality Investigative Protocol*. Eight houses had suffered basement seepage or flooding. Four of those had previously been identified as contaminated with *Stachybotrys chartarum* while two others had been previously identified as contaminated with other molds.

Recommendations for each of the eight homes, for other homes in the community, for home occupants and for new construction are included in this report. A shift in focus is offered in the recommendations. That shift includes insulation of existing basements on the exterior; provision of new shallow crawlspace foundations for some houses; installation of better mechanical ventilation; and development of a model construction and

MOISTURE & MOLD

inspection standard for new construction. It is recommended that any new homes be energy efficient slab-on-grade bungalows; suitable for the high occupancy rate, poor drainage and cold climate of this community.

Prepared by Bill Boles, Boles Construction. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Virginia Salares. Ottawa: CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

 : See also items in the *High-Rise and Multiple Unit Construction Section*, p. 35-49.

NORTHERN HOUSING

INNOVATIVE FOUNDATIONS, HEATING & VENTILATION.

This R&D&C (research, development, commercialization) project and first stage monitoring is complete and a report due before the end of 1998. CMHC, Yukon Housing Corporation (YHC) and Yukon Energy partnered in building two research/demonstration houses in Dawson City, Yukon. This work is a continuation of previous successes in R&D&C of the space frame foundation technology now being exported to Alaska. The thrust of the current foundation work is to reduce cost, develop a technology that can be locally manufactured and reduce the height of the crawl space.

A torque tube HSS steel section is under one house. The other house will be an extension of the sheet metal reinforced plywood monocoque technology resting on three bearing points. Lots of ground movement has been reported so the test site is proving to be a good demonstration. After a review of northern and remote technology, the heating and ventilation systems incorporate and optimize energy efficiency, minimal equipment and sustainable ventilation operation. Construction is complete and the houses are occupied. Commissioning of the project was a large task and the systems appear to be running efficiently at about half the energy consumption of a typical northern house. The mechanical technology was used on another YHC project at substantial capital savings and with some modifications appears to be the technology of choice. Work is underway to develop a more cost effective and simple foundation system.

CMHC Project Officer: Rob Duncan

CIDN: 1676 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NoRTH WEB-SITE.

The purpose of this partnership project was to design, establish and maintain a dedicated NoRTH Web-Site for a two year period. The project partners are CMHC, Alaska Housing and Finance Corporation, and Yukon College. The web-site includes relevant technical information such as factsheets of research reports and the Frostline newsletter. It also includes discussion groups to provide a means of ongoing and current communication. The web-site has links to other relevant web-sites and can be visited at www.NoRTH-RTHN.org. It is scheduled to be launched in the Fall of 1998.

CMHC Project Officer: Darrel Smith

CIDN: 1886 0200001

Division: Research Division

STATUS: Ongoing Project

RENOVATION & INSPECTION

BEFORE YOU RENOVATE - RENOVATION GUIDE AND CATALOGUE.

Everyone has a different reason for wanting to renovate. Sometimes it's the simple need for a change. Other times, the motivation is more practical. If you wake up one day with a puddle in the basement and a water-stained ceiling, you know you have to act fast. Whatever the case, Canada Mortgage and Housing Corporation (CMHC) can help. For more than 50 years, we've been the nation's housing experts: we know what it takes to make a renovation project run smoothly and successfully. From the planning stage to the final touches, this guide shares our experience and knowledge with you. And it tells you about some of the first-rate resources we've developed to deal with all kinds of renovation issues. Replacing the 1997/98 version, this publication continues to contain step-by-step details on planning a successful renovation, how to hire a contractor, a payback range of typical renovations, a sample contract, etc.

Ottawa: Canada Mortgage and Housing Corporation, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre: *Avant de rénover - Guide et catalogue pour la rénovation.*

RENOVATION & INSPECTION

THE CANADIAN ASSOCIATION OF HOME AND PROPERTY INSPECTORS INITIATIVE.

The Canadian Association of Home and Property Inspectors (CAHPI) is a newly formed association that will represent the private home inspectors in Canada. This association is comprised of a number of national and provincial associations, including some of the major franchises, and a number of independent inspection firms. CAHPI currently represents over 600 private home inspectors, but it is anticipated that other, non-affiliated private home inspectors will increase this number in the future. Formal agreements and establishing their future requirements is currently being undertaken. A CAHPI Board has been established and they are now proceeding with setting-up and determining the responsibilities of the various committees such as, By-Laws, Accreditation and Certification, Strategic Relations, Education, Standard of Practice and Code of Ethics, and Discipline. CMHC continues to support this initiative.

CMHC Project Officer: Darrel Smith

CIDN: 1962 0200002

Division: Research Division

STATUS: Ongoing Project

THE CANADIAN RENOVATION INDUSTRY AND THE INTERNET: USAGE PATTERNS, 1998-2001.

The objective of this project is to survey renovators about their use of e-mail, web-sites, and interactive online communications.

CMHC Project Officer: Darrel Smith

CIDN: 2015 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Donald M. Caskie
R.R.2
Paris, Ontario
N3L 3E2

AVAILABILITY: Publication not yet available

THE HEALTHY HOUSING RENOVATION PLANNER.

The purpose of this project is to develop a consumer renovation book that will focus on Healthy Housing. This book will look at the various renovation projects commonly undertaken and will provide the consumer with the information they require to plan a Healthy Housing renovation. The book is expected to be available by the Fall of 1998.

CMHC Project Officer: Darrel Smith

CIDN: 1760 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RENOVATION & INSPECTION

HOMEOWNER MOTIVATION AND INNER CITY REVITALIZATION: AN EXAMINATION OF RELATED FACTORS IN WINNIPEG.

The objective of this research is to identify the revitalization process underway (e.g.) incumbent upgrading or gentrification in inner city areas demonstrating a high level of renovation activity.

CMHC Project Officer: Glynis Kossatz

CIDN: 1277 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Tom Carter
University of Winnipeg
Dept. of Geography
Winnipeg, Manitoba
R3B 2E9

AVAILABILITY: Publication not yet available

HOW HEALTHY IS YOUR HOUSE: CMHC HOMEOWNER'S AND HOMEBUYER'S CHECKLIST FOR MAINTENANCE AND REPAIR.

The current CMHC's Homeowner's and Homebuyer's: Inspection Checklist for Maintenance and Repair is being revised to both update and include a Healthy Housing evaluation "tool". It will provide homeowners and homebuyers with a pre-purchase or pre-renovation guide for performing an inspection on their house. Physical condition, IAQ, energy and environmental and maintenance and repair information will be included in the document. It will be beneficial in enabling consumers to make more informed decisions prior to hiring the assistance of a private home inspector should the need arise. This advisory document will be available in the Spring of 1999.

CMHC Project Officer: Darrel Smith

CIDN: 1901 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INTEGRATING HEALTHY HOUSING AND ENERGY EFFICIENCY IN MAJOR RENOVATIONS.

Homeowners who undertake major renovations often miss the opportunities to make their houses healthier and more energy efficient. This project has targeted homeowners in the midst of major renovations and examined what changes would improve their designs. It also looked at where the homeowners and renovators find the information on which they base their design decisions. Eight houses of a proposed twelve have been studied so far. The contractor is looking for ways to encourage participation by both the homeowner and the contractor, and is finding it difficult to obtain contractor involvement in the survey.

CMHC Project Officer: Don Fugler

CIDN: 1898 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RENOVATION DEMONSTRATION CASE STUDY BOOKLET.

CMHC and Natural Resources Canada in partnership with CHBA undertook a pilot Red Deer Project '94 renovation demonstration and six other similar projects in 1996/97. The Red Deer Project '94, conducted by the Red Deer Home Builders' Association, and six other projects, 5 with the local HBA's in Annapolis Valley, Ottawa-Carleton, Kitchener-Waterloo, Fraser Valley, and North Okanagan and one with APCHQ in Region de l'Estrie will be presented in a case study booklet. This publication will also include information for both homeowners and renovators on Healthy Housing, energy retrofits, and the value of using qualified renovators for their renovation work. The booklet will be available in the Fall of 1998.

CMHC Project Officer: Darrel Smith

CIDN: 1530 0300010

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RENOVATION OF GENERIC HOUSING STYLES - POST-WAR ONE-AND-A-HALF STOREY.

The objective of this project is to provide consumer information on typical approaches to the repair and renovation of post-war one-and-a-half storey houses. Criteria for these approaches will include occupant lifestyle and needs, structural and maintenance requirements, "Healthy Housing" improvements (including environmental and energy-efficiency), and the impact on home equity and resale value. CMHC is preparing the document for publication, likely in early 1999.

CMHC Project Officer: Don Fugler

CIDN: 1430 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RENOVATOR TRAINING IN CANADA: AN EVALUATION AND SITUATION REPORT.

Through the use of surveys, telephone conversations and focus groups, this project will evaluate the current situation with respect to renovation contractor training in Canada. A situation report will be produced to determine who else is providing training for the residential construction industry with a focus on the renovator. Other issues related to this include marketing, financing, existing materials, relationship to certification, native initiatives, and options for delivery that reach beyond current CHBA membership. (ie: community colleges, private firms, etc.). The methods of delivery will also be researched (ie: five day, correspondence, computer-based, etc.).

CMHC Project Officer: Darrel Smith

CIDN: 2044 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RENOVATORS AND TECHNOLOGICAL CHANGE IN THE SINGLE FAMILY HOUSING MARKET IN CANADA, 1990-2005.

This study examines the dissemination of information about new technology to renovators and the utilization of the new technology by renovators in their renovations of owner-occupied single family detached and semi-detached homes in Canada between the years 1990 and 2005.

Although technological change in the residential renovation industry is gradual and cumulative, it is increasing both in the speed and in the range of new materials, methods and equipment being introduced, especially in the use of electronics in the mechanical and electrical fields and in the use of prefabricated and man-made components. The main trends in the types of technology being used by renovators are: (a) heating, ventilation and air-conditioning products, (b) energy efficient products, particularly windows, and (c) engineered and man-made wood products. These items are designed to increase comfort and convenience, improve the quality of the indoor environment, reduce maintenance, and cut energy costs. In order to remain competitive renovators need to be fully aware of new technology and its implications for controlling costs, increasing productivity and meeting the needs of their clients.

It is becoming more difficult, costly and time-consuming for renovators and even their specialized sub-contractors to keep fully informed about these changes using traditional means of research including trade magazines and trade shows.

Renovators need to devote more attention in the future to the following issues:

- Making the access to information about new renovation technology easier and quicker, yet still economical;
- Upgrading the skill levels of sub-contractors and trades and maintaining and upgrading the skill levels of renovators in reference to the use of new renovation technology;
- Evaluating the potential impact on the home renovation industry of using the Internet and related technology in such areas as searching for information about the existence and use of new technology, finding answers from experts about building science problems, upgrading skill levels, advertising and marketing of products and services, and communicating within the industry about common issues of concern.

Prepared by Donald M. Caskie. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officers: Terry Marshall and Darrel Smith. Ottawa: CMHC, 1998. (External Research Program).

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
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Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

RENOVATOR'S TECHNICAL GUIDE.

Since the publication of the *Renovator's Business Guide* in 1994, a need for a text dealing with the building science of renovations has been recognized. This publication addresses those issues and is expected to be widely used as a reference in the field across Canada. Both *Renovator's Business Guide* and *Renovator's Technical Guide* are publications that complement the many how-to renovation manuals available.

This guide does not attempt to explain how to perform renovations but deals instead with why renovations become necessary. It looks at the performance of the house and the normal and abnormal conditions that can drive the need to renovate. The guide looks at the systems within the house, how they interact and how an alteration to one can cause another to malfunction. It explores both the existing problems of houses to be renovated and the implications of any changes being considered.

The guide is intended as a reference that permits the reader to move through the document from beginning to end. However, the convenient format of the publication also allows for quick reference of specific problems or renovations on an "as needed" basis.

The inclusion of building science "Insights" throughout this guide is meant to increase awareness of important building science issues that are sometimes misunderstood or forgotten during renovation procedures. These and the Healthy Housing Information contained in each chapter reflect growing concerns about occupant health and environment impacts in the renovation industry.

The guide focuses on why problems occur, how to avoid them and how not to create new ones as you renovate a house.

Prepared by Michael Lio, Lio and Associates. Contributors: T.C. Paige Crewson ... et al. Ottawa: Canada Mortgage and Housing Corporation, 1998.

Order number: 6993E. **Price: \$34.95 + GST and handling charges. 235 pages

STATUS: Completed Report

AVAILABILITY: CMHC Information Products
P.O. Box 35005
Stn BRM B
Toronto, Ontario M7Y 6E5
1-800-668-2642
Fax orders from Canada: 1-800-245-9274
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre: *Guide technique du rénovateur.*

TOXIC MOLD CLEAN UP PROCEDURES: A GUIDE FOR CONTRACTORS.

This guide provides advice to specialty cleanup contractors on how to clean up a house contaminated with toxic molds, such as *Stachybotrys chartarum*, including how to protect workers and occupants. A separate guide will be developed on how to renovate to prevent moisture problems (ventilation, moisture source control and surface temperature control). The first three drafts have been reviewed by public health officials (including the Center for Disease Control in Atlanta, Georgia) and selected mold and building science researchers and their comments incorporated. The format of the document is designed so that it could be used contractually by public health agencies. The document is in production.

CMHC Project Officer: Jim White

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

ACTION PLAN FOR REDUCING GREENHOUSE GASES IN RURAL COMMUNITIES.

The purpose of this project is to prepare an integrated planning strategy that would provide guidance for rural municipalities across Canada facing the challenges of developing action plans for achieving Kyoto targets for reducing greenhouse gas (GHG) emissions. A rural Canadian community that will be developing an action plan for reducing GHGs will be selected for study. Funding will be directed to documenting the development of the action plan to ensure that the appropriate actions are considered, implemented, monitored and the results disseminated. The objective is to provide an innovative, comprehensive planning approach for rural communities that integrates transportation planning, land use planning, new housing and retrofits, waste management, economic development and the regulatory environment.

CMHC Project Officer: Susan Fisher

CIDN: 2105 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

COMPARISON OF COSTS AND RESOURCE-EFFICIENCY OF SEVEN RESIDENTIAL LANDSCAPE OPTIONS.

This research study is to quantify and compare the annual horticultural inputs (i.e. materials), time, costs and environmental impacts associated with maintaining seven different landscape types. After annual inputs are determined, the capital and life-cycle costs for a typical residential lot will also be calculated. The seven landscape types will include (in post-establishment growth states): wildflower meadow/prairie; naturalized woodland/shade garden; xeriscape; lawn area with hardy, low maintenance species; manicured lawn with conventional species; ornamental shrubs and trees; and annuals and perennial borders. The study will assess the potential environmental impacts of each option as well as their aesthetic and functional implications. In addition, potential benefits, such as wildlife habitat, bio-diversity and reduced storm water run-off will be identified and quantified. The final product will be a publication intended for municipal decision makers, advisors in planning and environmental management departments, homeowners and property managers. It will show how they can save resources, reduce environmental impacts, as well as save money and time through reductions in horticultural inputs.

CMHC Project Officer: Susan Fisher

CIDN: 1976 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

CONSTRUCTION RESOURCE MANAGEMENT COURSE - PHASE II.

A private and public sector consortium has been established to develop a methodology for assisting industry to better understand, control and reduce the levels of construction, renovation and demolition (CRD) waste. To date, the partners include Industry Canada, Canada Mortgage and Housing Corporation, Alberta Environmental Protection, NWT Department of Resources, and PCL Constructors Canada Inc. Phase I was the development of a CRD training course that was published in hard copy. The course was based upon and adapted from existing construction waste reduction courses that have been designed to clarify waste reduction issues. Phase II will consist of an Internet based CRD project management course that will: provide current resource management information and case-specific solutions; contribute to the development of standard

SUSTAINABLE DEVELOPMENT & HEALTHY HOUSING

managerial practice; promote widespread communication of the best resource recovery techniques; contribute to economic growth and job creation; promote long-term behavioural change; and help industry associations and government departments meet mandated environmental targets. The project has a planned completion date for the Spring of 1999.

CMHC Project Officer: Darrel Smith

CIDN: 2032 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet

DEMONSTRATION OF HEALTHY HOUSING ON RESERVE.

This project formerly reported as "Water & Sewage Disposal in Northern & Remote Locations" will now form part of the Northern Healthy House initiative. The objectives are to support the design, construction and demonstration of five on-reserve Healthy Houses in northern and southern Ontario during 1998/99. This initiative will demonstrate alternative Healthy Housing designs with features appropriate for remote communities. Features such as preferred alternatives to conventional energy, water and sewer infrastructure will be researched. Construction will commence in the Fall of 1998 with the public demonstration beginning in the Spring of 1999. House design and construction will be by locally trained trades and specialists. A CMHC report will be produced detailing house costs and benefits, designs and systems at the completion of the project, together with progress updates posted on CMHC's North Website.

CMHC Project Officer: Chris Ives

CIDN: 1969 0200003,
1969 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available.

DEVELOPMENT OF COMMUNITY-BASED SOCIAL MARKETING APPROACHES FOR ACHIEVING SUSTAINABILITY: FINAL REPORT.

In addition to technological innovation, the movement to a sustainable future will also require changes in the individual attitudes and behaviours of Canadians. However, while a wide variety of programs have been effective at shifting environmental attitudes, few programs have had much success at shifting related behaviours. Correspondingly, despite the environmental commitment of Canadians, we are proving to be slow in adopting sustainable lifestyles and in using related products and services. Furthermore, the body of knowledge regarding how to promote conserver behaviours is poorly developed at this time, and there are few models for program planners and implementers to work with.

This project was therefore designed to help overcome these obstacles. Its objectives were:

- to advance understanding of how to develop and implement community-based social marketing approaches for bringing about and maintaining conserver behaviours, and
- to rapidly disseminate this understanding to current and potential program planners and implementers across Canada, by means of a "hands on" workbook and five training sessions (including a "train the trainer" component) presented across the country.

In order to accomplish the objectives listed above, the following work was undertaken

- the project built on a theoretical framework originally developed from the academic literature.
- primary research was conducted with ten Canadian sites,

- fifteen additional case studies from across North America were selected for secondary research,
- the results were synthesized into a workbook and workshop, which were market tested, peer reviewed, produced and delivered, and
- partnerships were developed with key stakeholders across Canada, including community and environmental organizations, businesses, and all levels of government.

Prepared by: Jay Kassirer, Cullbridge Marketing and Communication, and Pinecrest Queensway Community Economic Development Group, Inc. registered and known as "West End Community Ventures". Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Manager: Sue Ann Rothwell. Ottawa: CMHC, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
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Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

HEALTHY HOUSING COST-BENEFIT STUDY.

The objective of this project was to identify the cost and the benefits of applying Healthy Housing principles, i.e. Occupant Health, Energy Efficiency, Resource Efficiency, Environmental Impact, and Affordability to the construction and renovation of homes. The cost benefit analysis treats the Healthy Housing features individually for the benefit of both the renovation market and for new construction. The study includes Healthy Housing capital costs and effects on the operating costs, such as reductions in energy or water consumption, and identifies the hidden benefits such as occupant health and durability of materials.

CMHC Project Officer: Darrel Smith

CIDN: 1905 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HEALTHY HOUSING SEMINAR.

A two and a half hour consumer Healthy Housing seminar, with a renovation focus, has been developed and packaged for delivery. The material was based on existing material produced by the CMHC Ontario and British Columbia Regional offices. It was also updated to include recent research and to give it a national scope. Examples of case studies were included by incorporating material from the 1994 and 1996 Renovation Demonstration projects. CMHC has entered into a partnership with the building supply industry for delivery of these seminars. Presenters will consist of both private presenters and the training staff of our retail partners. The seminars will be held across Canada, however the actual locations and timing are being negotiated with the project partners. It is anticipated that the seminars will commence in the Fall of 1998.

A condensed 30-minute presentation of the Healthy Housing Seminar was also produced. This material can be used at home builder association meetings, various industry shows and conferences and also in the preparation of background documents.

CMHC Project Officer: Darrel Smith

CIDN: 1906 0200001

Division: Research Division

STATUS: Ongoing Project

MULTIFAMILY HOUSING FOR COMMUNITY SUSTAINABILITY.

This project will produce information to assist developers and municipalities in developing land at higher than current average densities by means of multiple housing forms. It will assemble and develop exemplary multiple housing solutions and assess consumer demand for these. It will also identify market segments and strategies to attract them to medium density housing. This is a collaborative project with the Regional Municipality of Ottawa Carleton and NRCan both of which have a strong interest in community sustainability. Final report is expected in May 1999.

CMHC Project Officer: Fanis Grammenos, Research Division

CIDN: 1628 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

OPTIMISATION MICRO-CLIMATIQUE DE LA BANLIEUE NORDIQUE EN FONCTION DU VENT.

This research proposes to analyze wind behaviour in the outdoor areas of a typical existing suburb in view of identifying and modifying the critical discomfort zones through architectural and landscaping interventions at the parcel and public area level. The observation and interpretation of snow accumulation simulated using a hydraulic tunnel that becomes a global integrator allowing for a visual synthesis of the complex behaviour of the wind. The results, presented in the form of comparative graphs and tables, provide a design tool for architects and other designers in the redevelopment of intensification of existing suburbs. These results incorporate a performance index that integrates the paradoxical aspects linked to the wind, that is, the need for protection in the outdoor rest areas surrounding the residences and the need for natural clearing of snow accumulations in traffic areas. The aerodynamic solutions more specifically respond to the behaviour of the wind in the area of the city of Québec but, given the structural uniformity of suburbs regardless of any regional disparities, the results can still be generalized to all Canadian suburbs.

Prepared by André Potvin with the collaboration of Carole Després. Prepared for the Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Chris Ives. Ottawa: CMHC, 1998 (External Research Program).

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

OVERCOMING THE BARRIERS TO SUSTAINABLE REAL ESTATE DEVELOPMENT IN CANADA.

The research will develop criteria by which a community might be deemed to be considered sustainable. Using these criteria it will develop a clear picture of the status of sustainable development in Canada. With the same criteria it will develop a parallel analysis of successful international projects focusing on those which successfully address problems encountered in Canada. From this comparison it will generate potential directions which might assist Canadians in overcoming barriers to sustainable real estate development.

CMHC Project Officer: Doug Pollard

CIDN: 2051 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

PLANNING SUSTAINABLE COMMUNITIES.

The purpose of this project is to develop an updated advisory document on community planning and design. The updated document is intended to be a state-of-the-art report, reflecting the latest thinking in the field. The emphasis of the document will be on presenting best practices and case studies of innovative, sustainable and cost-effective approaches to community planning and design. It is anticipated to be available by mid - 1999.

CMHC Project Officer: David D'Amour, Research Division

CIDN: 1553 0200001

AVAILABILITY: Publication not yet available

STATUS: Ongoing Project

PROTOTYPE OF THE COMMUNITY SUSTAINABILITY INDICATORS SOFTWARE.

The purpose of this project is to develop and provide a working prototype of the Community Sustainability Indicators Software which will include a working demonstration of all the elements of the software concept.

CMHC Project Officer: John Engeland, Research Division

CIDN: 1796 0200002

AVAILABILITY: Publication not yet available

STATUS: Ongoing Project

STANDARDIZING THE PROCESS OF RESIDENTIAL DECONSTRUCTION.

The purpose of this project is to gather, review and analyse information on residential deconstruction, and determine what can contribute to ensuring that knowledgeable, appropriate and cost effective deconstruction applications and project decisions may be taken.

CMHC Project Officer: Darrel Smith

CIDN: 2022 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Derek Badger
c/o byDesign Consultants
24 Spruce Street
Ottawa, Ontario K1R 6N7

AVAILABILITY: Publication not yet available

*** NEW ***

SUSTAINABLE DESIGN CHARRETTE FOR THE SOUTH EAST FALSE CREEK NEIGHBOURHOOD OF VANCOUVER.

This project will report on the rationale and results of a design charrette structured to test the viability of sustainable community development guidelines. The report will include a brief history of the guideline development, the reasons for holding a charrette, a synopsis of CMHC research that was used, a critique of the effectiveness and value of the charrette. The report will also include planning drawings of the development area contracted by the city before and after the charrette, drawings done at the charrette itself and recommendations for charrettes in other communities.

CMHC Project Officer: Doug Pollard

CIDN: 2076 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

SUSTAINABLE LANDSCAPE DESIGN FOR RESIDENTIAL DEVELOPMENTS.

The objective of this project is to highlight the link between sustainable development for housing with the condition, composition and use of native vegetation.

CMHC Project Officer: Susan Fisher

CIDN: 1466 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Karen Vagelatos, Vagelatos Associates Landscape Architecture Ltd.
207-2211 West 4th Avenue
Vancouver, British Columbia, V6K 4S2

AVAILABILITY: Publication not yet available

 : Also see the following study on sustainable development

Page 110 : Sustainable Development in Canada

WATER CONSERVATION, REUSE & MANAGEMENT

AN APPLICATION GUIDE FOR WATER REUSE SYSTEMS.

This guideline application document is intended for those involved in the analysis, design, specification and operation of water reuse systems; to those who wish to become familiar with current developments in innovative water treatment systems and broaden their knowledge of water reuse problems and their solution. The contents will be of particular interest to engineers, managers, technical personnel and regulatory authorities. Information presented in this guide will be useful as a design and approval submission checklist. A how to get started and information required reference if you wish.

This water reuse application document is not intended to deal with issues associated with treated wastewater disposal to the environment and/or associated water quality discharge objectives.

References to specifications, studies and other publications are provided which can be consulted for further information on design practices and requirements for water reuse systems. A sample application form with instructions is also included which may be helpful to both applicants and review agencies. It is hoped the information provided in this document will assist in the development of approval submission procedures, guidelines and standards for water reuse applications.

Prepared by Totten Sims Hubicki Associates. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Cate Soroczan. Ottawa: CMHC, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre : *Guide de demande pour les systèmes de réutilisation de l'eau.*

DISCUSSION PAPER ON WATER REUSE - NEEDS, TRENDS AND CASE STUDIES.

This project will serve as a basis for discussion with agencies involved with water infrastructure, research groups, potential manufacturers of water technologies, and the general public. The research will identify water technologies, discuss performance through case studies, and highlight areas in Canada that are in need of such technologies. The final report is expected in November 1998.

CMHC Project Officer: Cate Soroczan

CIDN: 1927 0200003-4

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

EVALUATING THE PERFORMANCE OF ON-SITE SEWAGE DISPOSAL SYSTEMS.

On-site sewage disposal systems serve a significant proportion of the population of Canada. These systems provide a cost-effective alternative to central systems when they function properly. But they can and do malfunction, resulting in surface contamination where the soil system is unable to accept the septic tank effluent, or ground water contamination where the local soil system does not provide adequate treatment.

A study undertaken by the Centre for Water Resources Studies for CMHC concluded that "There is no simple, routine, or certain procedure to assess the capacity of an on-site system; a detailed assessment will be site-specific and will rely heavily on the knowledge and experience of the individual who conducts the examination." (Hennigar, 1993). The same report identified a field test, developed in California (Hantzshe, 1991), that has been used to assess the hydraulic capacity of soil absorption systems, and recommended evaluation of this procedure for Canadian conditions. Evaluation of that procedure is the subject of this report.

The objectives of the project reported were to:

- document experience with use of the leachfield evaluation test, by site visits and literature review;
- apply and evaluate the test under field conditions in Nova Scotia; and
- evaluate the test using a spreadsheet water balance model.

Prepared by D.H. Waller and J.D. Mooers. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officers: Al Houston and Chris Ives. Ottawa: CMHC, 1998 (External Research Program).

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions

GREYWATER TECHNOLOGY SOFTWARE DEVELOPMENT.

CMHC is participating with Water Technology International in this research project to further develop the TECHSPEX software package to address water use, reuse and treatment. This product will provide a number of technical solutions to onsite or small community water treatment requirements based on needs that the user specifies. Costs and availability for the items specified in the solution will also be provided in the completed software.

CMHC Project Officer: Cate Soroczan

CIDN: 1927 0200005

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INNOVATIVE ON-SITE WASTEWATER TREATMENT.

This project studied the impact of residential water conservation and on-site wastewater management on groundwater quality. In particular, it addressed the issue of nitrates in groundwater. The test site was a new, occupied rental unit containing code-approved water-conserving fixtures coupled to a novel on-site wastewater treatment system. A monitoring program determined the impact of the reduced waterflow on the baseline ground water quality. Initial loading conditions for this single house system indicated that it was possible to increase the recycling level of effluent to the Biofilter. Subsequent changes to the installation's recycling level demonstrated the potential for capacity increases and/or cost reductions. The final report has been reviewed and will be available in Fall 1998.

CMHC Project Officer: Chris Ives

CIDN: 1047 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INNOVATIVE RESIDENTIAL WATER AND WASTEWATER TECHNOLOGIES.

The purpose of this project is to identify and describe applications and research on innovative technologies for residential water supply and wastewater treatment.

CMHC Project Officer: Peter Russell

CIDN: 1832 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

THE LIVING BY WATER GUIDEBOOK.

The objective of this project is to prepare, publish, market and distribute a guidebook for waterfront residents on reducing environmental impacts of housing on aquatic and shoreline habitat.

CMHC Project Officer: Susan Fisher

CIDN: 2040 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*
NEW

ONSITE RECYCLED WATER QUALITY MONITORING.

This project will identify the available water quality monitoring technologies appropriate for on-site and small community reuse and treatment systems. The study will also examine issues of merit, cost of implementation and operational factors.

CMHC Project Officer: Cate Soroczán

CIDN: 1936 0200

Division: Research Division

STATUS: Planned

AVAILABILITY: Publication not yet available

QUAYSIDE VILLAGE GREYWATER DEMONSTRATION PROJECT.

A greywater system similar to that of the Toronto Healthy House system is being implemented into a 19 unit cohousing project in North Vancouver, B.C. This system will be capable of treating greywater from sinks, laundry, and showers for reuse in showers, laundry and toilets. Initial testing will be restricted to toilet reuse only. Double plumbing has already been installed and the greywater system will be installed later this year upon contractual agreement between the city and development regarding ongoing monitoring and maintenance. Upon completion the system will be subject to continuous online water quality monitoring and laboratory analysis to ensure that both the system and the online monitoring is working to satisfaction.

CMHC Project Officer: Cate Soroczán

CIDN: 1991 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

REPORT ON WATER AND WASTE WORKSHOP.

This project will provide a detailed report on a Workshop held at CMHC Oct. 22 on "Accelerating the Implementation of Innovative Water and Wastewater Treatment Management and Technology".

CMHC Project Officer: Peter Russell

CIDN: 1757 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

THE SUSTAINABLE HOME WATER SYSTEM.

The objective of this research is to develop a system which will collect rain water for non-potable uses in a house plus a grey water heat recovery and recycling system.

CMHC Project Officer: Peter Russell

CIDN: 1224 0200001

Division: Research Division, Housing Technology Incentives Program

STATUS: Ongoing Project

Grant Recipient: A.C.E. Alternative and Conservation Energies Inc.
1909-10th Avenue S.W.
Calgary, Alberta, T3C 0K3

AVAILABILITY: Publication not yet available

WATER RECYCLING DEMONSTRATION.

Research and development of greywater reuse is being undertaken in the Conservation Co-op apartment building in Ottawa. A facility in the basement filters and disinfects shower and bath water from 8 units which is reused as toilet flushing water. Initial design and component shortcomings have been corrected and the system is operational with hand-over to the building owners anticipated at the end of 1998. Plant performance and water quality are being measured with a report anticipated towards the end of 1998.

CMHC Project Officer: Peter Russell

CIDN: 1573 0201003,
1573 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

WATERSAVE : RESIDENTIAL WATER USE MODEL.

A user-friendly computer model was developed that determines daily water consumption for a prescribed pattern of water use in a house. It also incorporates facilities to treat and reuse grey water. The program will be of value to designers of innovative residential plumbing systems. Its first applications were for the design of the water system for the CMHC Toronto Healthy House and the Conservation Co-op apartment building in Ottawa (see "Water Recycling Demonstration").

CMHC Project Officer: Peter Russell

CIDN: 1422 0200002,
1422 0800001

Division: Research Division, Panel on Energy Research & Development

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SOCIAL AND ECONOMIC RESEARCH

ABORIGINAL HOUSING

ABORIGINAL HOUSING AND COMMUNITY SCENARIOS IN URBAN PRAIRIE CITIES.

This research project will explore alternative futures for the housing situation of Aboriginal peoples in selected Prairie cities. The technique to be employed is to construct a number of future scenarios for each location and to present them to a group of key people in each location and to record and analyse the ensuing discussions. A wide range of inputs would be used to construct the scenarios. Three scenarios would be used for each location - each would have a theme or story line and the basic themes would be repeated at each location. While the themes of the scenarios would be common to each location, each scenario would be "tuned" to account for local circumstance. Inputs would include, for example, demographic trends, local housing market conditions, and community plans and preferences as well as local opportunities.

CMHC Project Officer: Philip Deacon

Division: Research Division

STATUS: Planned

AVAILABILITY: Publication not yet available

*** NEW ***

CORE HOUSING NEED AMONG OFF-RESERVE ABORIGINAL LONE PARENTS IN CANADA.

This study, based on the 1991 Aboriginal Peoples Survey and Census, explores housing need among Aboriginal lone-parent households living off-reserve. It reports on the very high level of core housing need among these households and examines the reasons for it.

Prepared by Ark Research Associates, Research Manager: Aron Spector. Prepared for: Research Division, Canada Mortgage and Housing Corporation. CMHC Project Manager: John Engeland. Ottawa: CMHC. 1997.

Order number: PE0281. ****Price:** \$12.95 + GST and handling charges.

STATUS: Completed Report

AVAILABILITY: CMHC Information Products

P.O. Box 35005

Stn BRM B

Toronto, Ontario M7Y 6E5

1-800-668-2642

Fax orders from Canada: 1-800-245-9274

International clients see page 9 for order instructions

NOTE: Aussi disponible en français sous le titre : *Les besoins de logement des familles monoparentales autochtones hors réserves au Canada.*

FEASIBILITY AND VIABILITY OF MANAGING THE POOLED REPLACEMENT RESERVE FUNDS OF FIRST NATIONS AND URBAN NATIVE HOUSING GROUPS.

The objective of this project is to research and prepare a report which examines the feasibility and viability of managing the pooled replacement reserve funds of First Nations and Urban Native Housing groups.

CMHC Project Officer: Tina Heal

CIDN: 2084 1500001

Division: B.C. & Yukon Business Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

ABORIGINAL HOUSING

URBAN ABORIGINAL ACCESS TO HOUSING (AND HOMELESSNESS).

This research study will develop a longitudinal profile of Aboriginal household mobility, access to housing and homelessness using a historical interview technique. Snapshot surveys tell us that Aboriginal households are significantly more mobile than non-Aboriginal. This hyper mobility includes not only movement between reserve or home community and urban areas, but also between urban areas and within urban areas. The hyper mobility may lead to frequent difficulties in accessing accommodation, especially when coupled with the low socio-economic status of many Aboriginal households and discriminatory practices of some landlords. Some literature suggest that this combination of circumstances could be a major factor leading to Aboriginal homelessness. About 45% of the Aboriginal population live in cities and this segment of the population is expected to grow by almost half by 2016, which will likely exacerbate the situation.

CMHC Project Officer: Philip Deacon

CIDN: Plan 7-9018

Division: Research Division

STATUS: Planned

AVAILABILITY: Publication not yet available

*** NEW ***

CHILDREN'S ENVIRONMENTS

ENVIRONMENTAL SCAN: CHILD-CENTERED DESIGN.

This project will involve preparation of an environmental scan or background report on children and housing. This document will include information on demographics, social and economic characteristics, key players, references and potential consultants, as well as housing circumstances for children's housing and living environments.

CMHC Project Officer: Tom Kerwin

CIDN: Plan 7-6683

Division: Research Division

STATUS: Planned

AVAILABILITY: Publication not yet available

*** NEW ***

CITY PLANNING & HUMAN SETTLEMENTS

BRINGING THE HABITAT AGENDA HOME.

The purpose of this project is to publish a book to inform the membership and others in the Canadian Habitat NGO network about the outcome of the Habitat II Conference and the Habitat Agenda, as well as to provide information and ideas in order to facilitate the implementation of the Habitat Agenda.

CMHC Project Officer: Louis Musto

CIDN: 1965 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CITY PLANNING & HUMAN SETTLEMENTS

THE EFFECTS OF DEVELOPMENT CHARGES ON URBAN FORM.

CMHC recently initiated two projects looking at the effects of development charges on urban form. The first project is based primarily on a national survey of builders and developers to determine how the structure of development charges in different jurisdictions is affecting private sector development decisions related to location, density, and so on. The second study is an econometric analysis looking at the impact of development charges on housing costs, consumer housing choices, the characteristics of the new stock, and ultimately urban form.

CMHC Project Officer: David D'Amour

CIDN: 1941 0200001-2

Division: Research Division

STATUS: Ongoing project

AVAILABILITY: Publication not yet available

*** NEW ***

EVALUATION OF THE *ÉCO-QUARTIERS* PROGRAM.

The purpose of this project is to evaluate Montréal's *Éco-quartiers* program with regard to the management of the urban environment and the improvement of the living environment.

CMHC Project Officer: Susan Fisher

CIDN: 2001 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Gilles Sénécal, INRS-Urbanisation
3465 Durocher Street
Montréal, Quebec H2X 2C6

AVAILABILITY: Publication not yet available

COOPERATIVE AND NON-PROFIT HOUSING

BENCHMARKING PHYSICAL PLANT EXPENDITURES IN NON-PROFIT HOUSING.

The objective of this project is to assess expenditures and practices related to the physical plant in non-profit housing providers.

CMHC Project Officer: Duncan Hill

CIDN: 2003 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Marianne Moershel
R.R. #2, 2242 Queensborough Road,
Madoc, Ontario K0K 2K0

AVAILABILITY: Publication not yet available

*** NEW ***

BUILDING A MODEL FOR AFFORDABLE HOME OWNERSHIP: NEW DAWN ENTERPRISES: DOCUMENTATION AND ANALYSIS OF TWO ASSISTED MINI-HOME OWNERSHIP PROJECTS.

New Dawn, a not-for-profit community development corporation, prepared two case studies to determine whether manufactured housing would be one way to provide affordable homeownership for low-income households and those on social assistance. The people involved participated in the planning and development of collectively-owned mobile home parks. The two cases used existing properties in the community. One case rehabilitated a deteriorated privately-owned trailer park; the other developed a former military base.

In one case, the development was facilitated by a community worker from the provincial government and in the other by New Dawn itself. Both included education and training components, through which it was expected that participants would gain new skills, increased self-esteem and a stronger sense of community. Together, the two initiatives added thirty-six new manufactured homes and rehabilitated or created two manufactured-home parks.

The cases show that manufactured homes can provide an affordable option. However, important lessons were also learned about providing housing when the homeowners are dependent on social assistance. The Oceanside project has experienced a high level of default due to the inability of households on fixed social assistance incomes to meet unexpected or rising costs.

The collective self-help approach did generate benefits in terms of developing personal and organizational skills, strengthening the community and enabling bulk purchase. Better budgeting and a pre-purchase counselling process would be desirable in any future initiatives of this sort. The manufactured home provides a good quality home at a relatively affordable price and subject to municipal regulation of mobile home parks may be easily transferable to other communities.

Submitted to Homegrown Solutions. Submitted by New Dawn Enterprises Limited. Ottawa: Canada Mortgage and Housing Corporation, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre : *L'élaboration d'un modèle abordable d'accès à la propriété d'un logement.*

COOPERATIVE AND NON-PROFIT HOUSING

CRISIS SITUATIONS IN COOPERATIVES: INCREASING UNDERSTANDING TO IMPROVE INTERVENTION.

This research project concerns crisis situations in housing cooperatives: the conditions in which they emerge, but especially the dynamics put in place to resolve them.

CMHC Project Officer: Marie Murphy

CIDN: 2018 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: André Fortin
Confédération québécoise des coopératives d'habitation
1085 de Salaberry Avenue
Quebec, Quebec G1R 2V7

AVAILABILITY: Publication not yet available

* NEW *

A HOUSING COOPERATIVE FOR SELF-EMPLOYED WORKERS: FINAL REPORT.

This study reports on an initiative which explored the potential of a housing development that would include independent working spaces and communal office facilities. Individuals operating a small business out of their homes often experience a sense of isolation; at the same time, working from home creates pressures on both the living space and family life. For small independent workers, commercial space is generally quite expensive, and for many, costs may be prohibitive.

The initiative to date has involved two phases: first, information was collected on the needs of the self-employed population and focus groups were organized to develop specific design features for an actual project; second, an investigation was undertaken of the potential financing and some specific sites.

The group suggested 25 housing units as the ideal size. The commercial space would be owned on an equity co-op basis. It would include private offices, meeting areas, a kitchenette, a washroom and a service area for a photocopier and other shared facilities. The preferred location is the Plateau Mont-Royal district, which is central and close to specialized services. Also, this location has the most significant concentration of independent workers in the Montreal area.

The group has not yet been successful in securing a site. Unable to acquire either of two initial possibilities, a school and an industrial building, the search continues, focusing on properties coming on the market which would be appropriate candidates for conversion.

The proponents have to compete with the private market for the purchase of a building while land prices rise in the chosen district. They have sought the support of neighbourhood residents and also gained the support of a new organization, the Regroupement des travailleurs indépendants du Plateau Mont-Royal.

As the project might also qualify for a Quebec program for central neighbourhood revitalization, the proponents have sought the help of the Société d'habitation du Québec in financing the common elements. They have been invited to submit a detailed proposal under an experimental project. Once a building has been found, they intend to explore, with the Canadian Centre for Public-Private Partnerships in Housing in CMHC, how self-employed workers could qualify for a mortgage.

COOPERATIVE AND NON-PROFIT HOUSING

Prepared for the Homegrown Solutions Program. Coordinator: François Cadotte of FC Recherche; Associate: Jocelyn Duff of Habitat sur mesure. Ottawa: Canada Mortgage and Housing Corporation, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
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Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre : *Une coopérative d'habitation pour travailleurs autonomes.*

MEMBER INTEGRATION - MANAGEMENT PRACTICES IN HOUSING COOPERATIVES.

The research project aims to study the integration and housing processes within the management practices in cooperative housing environments.

CMHC Project Officer: Glynis Kossatz

CIDN: 1451 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Marie J. Bouchard
Université du Québec à Montréal
P.O. Box 6192, Station CV
Montréal, Quebec H3C 4R2

AVAILABILITY: Publication not yet available

NEW BEGINNINGS HOUSING COOPERATIVE: HOME OWNERSHIP MADE EASIER.

This study reports on an initiative which allows low-income households to own their own homes at costs below that of renting. The idea came from a local realtor who brought it to the City of Prince Albert. The city then drew on other community representatives and provincial agencies in a true partnership.

Benefiting from the relatively lower price of housing in Prince Albert, the initiative has developed a program *Home Ownership Made Easier (HOME)* to acquire and renovate existing homes. An advisory group of community partners helped low-income households form a cooperative which oversees the purchase and renovation of the homes and holds the mortgage until it is repaid over a 10-year period. At this point, the occupant receives title. The cooperative members participate in providing sweat equity toward the down payment. The province and city have also provided some financial assistance to help meet the down payment.

Since its inception in early 1997 the cooperative has assisted 14 households to acquire and renovate homes for less than \$40,000 and valued at approximately \$53,000 after renovation. The typical monthly cost is under \$350/month. Their aim is to assist 20 households in this pilot phase. The initiative provides a supportive process to help individuals develop financial and ownership skills to move to home ownership. Through the renovation process it has helped to upgrade the existing housing in the city.

COOPERATIVE AND NON-PROFIT HOUSING

Documentation and analysis submitted to: Homegrown Solutions. Submitted by: The New Beginnings Housing Cooperative. Ottawa: Canada Mortgage and Housing Corporation, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
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Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre : *La coopérative d'habitation New Beginnings.*

SOUTHWEST SITE OF LA PETITE PATRIE SEEKING COLLECTIVE SOLUTIONS FOR BETTER HOUSING IN LA PETITE PATRIE : FINAL REPORT.

This report describes the work of *Partenaires logement* to acquire an affordable housing portfolio of approximately 140 units in the "Southwest Site" of La Petite Patrie. The "Southwest Site" project is in a neighbourhood where the built environment and the residents' quality of life has severely deteriorated.

Partenaires logement have developed a two-pronged intervention strategy: regenerate the Southwest area of the neighbourhood based on formative housing cooperative and NP0 projects; and ensure that the resident population will benefit directly and on a priority basis from revitalization activities. To this end, *Partenaires logement* have set themselves two objectives:

- improve the built environment and resident's living environment; and
- increase the affordable housing supply.

The approach developed to reach these objectives involves community, financial, institutional and political stakeholders in la Petite Patrie. It is designed to mobilize all of these players in the creation of financial levers specifically dedicated to the development of social housing.

Submitted to Homegrown Solutions Maison. Ottawa: Canada Mortgage and Housing Corporation, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre : *Chantier sud-ouest de la Petite Patrie.*

BUILDING A SAFER SOCIETY: CRIME PREVENTION IN RESIDENTIAL ENVIRONMENTS.

This review of the research relating to the effectiveness of crime prevention in residential environments shows that communities can reduce crime if they do a good job of planning, implementing and evaluating their programs. The report looks at individual responses to crime (property marking programs), community responses (neighbourhood watch, safety audits), Crime Prevention Through Environmental Design (target hardening, defensible space), and crime prevention in high crime neighbourhoods.

Prepared by Rick Linden and Prairie Research Associates Inc. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Brenda Baxter. Ottawa: CMHC, 1997.

Order number : PE0288. **Price: \$12.95 + GST and handling charges.

STATUS: Completed Report

AVAILABILITY: CMHC Information Products

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International clients see page 9 for order instructions

NOTE: Aussi disponible en français sous le titre : *Pour une société plus sûre : la prévention du crime dans les milieux résidentiels.*

PUBLIC INITIATIVES IN HOUSING: THEIR CONTRIBUTION TO SECURITY IMPROVEMENT AND CRIME PREVENTION: THE CASE OF MONTREAL NEIGHBOURHOODS.

The main purpose of this study was to examine to what extent public initiatives in housing can help to improve security and prevent crime in Montreal neighbourhoods. The different neighbourhoods selected were; Côte-des-Neiges, Petite-Patrie and Saint-Michel.

The three neighbourhoods included examples of all public initiatives in housing carried out under various housing programs between 1989 and 1996: the acquisition/renovation program of the Office municipal d'habitation du Montréal (OMHM - Montreal Municipal Housing Board), the Rental Building Renovation Program (RBRP), the Private Non-Profit Housing Program (PNHP), the Index-Linked Mortgage (ILM) Co-operative Housing Program, and the Rental Housing Acquisition Program (RHAP). These initiatives, all of which included renovations, covered a wide range of buildings featuring various types of building management: housing co-operatives, low-income housing (LIH), building managed by non-profit organizations (NPOs), and privately-owned rental buildings.

The study was principally based on a survey administered to three groups of respondents (totalling 1,006 persons) in each of the selected neighbourhoods: residents in buildings targeted by a housing initiative (*residents in initiative zones*), their *neighbours* and residents in zones unaffected by these housing initiatives (*respondents in control zones*).

The results of the study show that the renovations help to improve the condition of the dwellings and the security devices in rental buildings. But beyond these physical measures, the type of management in buildings affected by public initiatives in housing has a greater influence on residents' sense of responsibility of building maintenance and on informal social control, and are most often found in housing co-operatives. Physical measures do not seem to be enough: one must also look at the internal organization of tenants within buildings. The differences between the three neighbourhoods also underscore the need to take the particularities of each community into account. The findings accentuate the importance of assessing problems on a neighbourhood

CRIME PREVENTION

level and the need for a comprehensive approach in analyzing the factors that contribute to crime and fear of crime, and in implementing initiatives targeting these problems.

Prepared by: the Société de développement de Montréal (formerly the Société d'habitation et de développement de Montréal). Prepared for: Canada Mortgage and Housing Corporation and the Société d'habitation du Québec. Ottawa: CMHC, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642, Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre : *Interventions publiques en habitation : leur rôle dans l'amélioration de la sécurité et la prévention de la criminalité : l'expérience des quartiers Montréalais.*

SAFE COMMUNITIES: INFORMATION PRODUCTS AND TRAINING MATERIALS.

In partnership with the RCMP, CMHC is developing materials to promote the principles of crime prevention through environmental design (CPTED). Priorities were identified at a stakeholder forum held in the Spring of '97. Materials include case studies of success stories at the subdivision and community level, and the enhancement and adaptation of training materials for a variety of distinct audiences, including builders and developers. The advisory document is expected to be available in the Spring of 1999.

CMHC Project Officer: Mark Holtzman

CIDN: 1938 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

VOICES FOR SAFE NEIGHBOURHOODS.

This do-it-yourself guide for coordinating safety audits in residential neighbourhoods will help a community work together to perform a safety audit. It integrates the knowledges of experts and the experience of residents and others who have been through the process. It shows what can be done to identify threats to safety and security and to create a safer neighbourhood.

Prepared by Rural and Small Town Programme, Mount Allison University. Funded by Canada Mortgage and Housing Corporation and the Royal Canadian Mounted Police. Ottawa: CMHC, 1998.

Order number : PE0297.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642, Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre : *Des voix pour la sécurité des quartiers.*

DISCRIMINATION IN HOUSING

HOUSING AND DISCRIMINATION: A REVIEW OF CURRENT KNOWLEDGE.

The objective of this research is to identify and examine what knowledge and expertise regarding housing-related discrimination is available in or applicable to Canada.

CMHC Project Officer: Teresa Van Den Boogaard

CIDN: 1792 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSING AND DISCRIMINATION: THE LEGAL FRAMEWORK.

The purpose of this project is to examine housing-related discrimination from a legal perspective to understand how housing-related discrimination fits in Canada's legal framework.

CMHC Project Officer: Teresa Van Den Boogaard

CIDN: 1793 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOME OWNERSHIP

METHODS USED ABROAD TO SUPPORT ACCESS TO HOME OWNERSHIP.

The objective of this research is to investigate significant and novel mechanisms which other nations have employed, encouraged and/or are considering that support and facilitate access to home ownership in general or to target populations. The intent is to identify new mechanisms that might be implemented in Canada that hold promise to improve access to home ownership. The review will cover the U.S., U.K., Germany, France, Australia and New Zealand. The research is being managed under the direction of an advisory committee composed of representatives from the Canadian Home Builder's Association, a Vice President of a major Canadian bank, the Mortgage Insurance Fund, CMHC's Market Analysis Centre and Research Division. This project will be of interest to the construction and renovation industry, the real estate sales sector, mortgage lenders and insurers as well as federal and provincial housing policy analysts.

CMHC Project Officer: David Metzack

CIDN: 1931 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOMELESSNESS

BEST PRACTICES ADDRESSING HOMELESSNESS: DOCUMENTATION.

This project will document a cross-section of 6 to 10 projects that have successfully addressed the needs of the Canadian homeless population. Best practices will represent the range of approaches to homelessness across Canada and will reflect the regions of the country, the variety of initiative types (e.g., emergency shelters, rooming houses, shelter and service support) and populations served (e.g., youth, single women, single men, and families).

HOMELESSNESS

CMHC Project Officer: Tom Kerwin

CIDN: 1978 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

CHRONIC HOMELESSNESS AMONG WOMEN: A DECADE OF CHANGING NEEDS AND SERVICES.

The objective of this project is to undertake a retrospective review of the changing patterns of women's homelessness in the Toronto area with a focus on chronically homeless women and innovative services, based on the observations and expertise of those who have worked closely with homeless women over the past decade.

CMHC Project Officer: Brenda Baxter

CIDN: 2000 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Sylvia Novac
593A Melita Crescent
Toronto, Ontario
M6G 3Y7

AVAILABILITY: Publication not yet available

*** NEW ***

ROUNDTABLES ON BEST PRACTICES ADDRESSING HOMELESSNESS.

CMHC will co-host five regional roundtables in early 1999 and a national roundtable in May or June 1999 on best practices addressing homelessness, using the "Best Practices Addressing Homelessness: Documentation" as a basis for discussion. Roundtables will allow opportunities for network building and exchange of information on effective best practices.

CMHC Project Officer: Tom Kerwin

CIDN: 2064 0200

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

SERVICES FOR CHILDREN AND YOUTH IN CANADIAN SHELTERS FOR HOMELESS FAMILIES.

This project will investigate space allocations and services for youth and children available in emergency family shelters (i.e., family units in homeless shelters, temporary and satellite shelters such as hotels, and shelters for victims of family violence).

CMHC Project Officer: Tom Kerwin

CIDN: 2085 0200

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

HOUSING AND POPULATION HEALTH.

This research project will explore the links between housing and population health. Population health is a way of conceptualizing and acting on health, by focusing on why some groups in society are more prone to illness than other groups. This study will look at the extent to which housing is or may be a factor. The study will commence with a comprehensive and critical review of the literature. This will be followed by an assessment of the evidence to date and the potential for evidence in the future, with an emphasis on the methodological and measurement issues. The project will conclude with a set of ideas for future research directions.

CMHC Project Officer: Philip Deacon

CIDN: 1926 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

INTERNATIONAL COVENANT ON ECONOMIC, SOCIAL AND CULTURAL RIGHTS BACKGROUND REPORT: THIRD REPORT OF CANADA ARTICLE 11: HOUSING.

This report is a supplement to the *Third Report of Canada* to the United Nations on progress achieved under the International Covenant on Economic, Social and Cultural Rights. Using the reporting guidelines suggested by the UN for the housing aspects of Article 11, this background report provides an overview of the Canadian housing system, in-depth coverage of housing needs in Canada, and detailed descriptions of measures taken by the federal government to address housing needs. Topics include: homelessness, core housing need, housing needs of children, Aboriginal peoples and persons with disabilities, enabling strategies, improving housing affordability and choice, and housing-related expenditures by governments. An index of activities, initiatives and programs is appended. The report primarily covers the period January 1, 1990 through December 31, 1994, with updates to the end of 1997 included as appropriate.

Ottawa: Canada Mortgage and Housing Corporation, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre : *Le Pacte international relatif aux droits économiques, sociaux et culturels : document d'information.*

HOUSING

RESIDENTIAL PROJECTS AND ROAD SAFETY.

The objective of this research is to make an inventory of the proposed residential development principles in view of ensuring the safety of the different road users and the quality of life of residents.

CMHC Project Officer: Leigh Howell

CIDN: 0925 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Denise Piché, Université Laval
School of Architecture
Québec, Québec
G1K 7P4

AVAILABILITY: Publication not yet available

HOUSING AFFORDABILITY

"AFFORDABLE PROJECT OF THE MONTH" WEB PAGE.

This project determined the feasibility, content and method of maintaining a monthly page on the CMHC web site that portrays successful, affordable housing projects. It examined the interests of the development community with regard to information on affordability, generated a structure and format that responds to these needs and created an initial database of appropriate projects that could be posted. Six projects were selected for posting and a contract is being prepared for formatting them for the web site. The Web page is expected to be operational by January 1999.

CMHC Project Officer: Fanis Grammenos

CIDN: 1878 0200001

Division: Research Division

STATUS: Ongoing Project

AFFORDABLE HOUSING INITIATIVES FROM THE CANADIAN NON-PROFIT HOUSING SECTOR.

The objective of this project is to document innovative approaches and "best practices" for creating affordable housing from the Canadian non-profit and municipal housing sector and to disseminate this information throughout the housing sector.

CMHC Project Officer: Fanis Grammenos

CIDN: 1794 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

HOUSING AFFORDABILITY

AFFORDABLE, VERSATILE HOUSING.

This project identifies and describes house designs that enable a house to accommodate a range of household types, sizes and needs by means of their adaptability. It documents the features of designs that have been built and it explains their economic and use advantages. The set of designs to be included will cover all housing forms, from detached houses to apartments. This first guide on adaptable designs will be made available both in hard copy and electronic format via the Internet. The final report will be available in the Fall of 1998.

CMHC Project Officer: Fanis Grammenos

CIDN: 1783 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

ALTERNATE TENURE ARRANGEMENTS.

The project has two broad objectives: (1) to develop an up-to-date consolidated source of information on the range of alternate tenure arrangements that can be used to implement affordable housing through partnerships; (2) to assess the extent to which projects utilizing alternate tenure arrangements have successfully met client needs, preferences and expectations. It is intended to be of interest to municipal and provincial officials, and not-for-profit and community groups. Work on the project will include a review of the types of alternate tenure arrangements that exist in Canada, as well as a more focused examination of specific Canadian alternate tenure arrangement projects.

CMHC Project Officer: David Scherlowski

Division: Research Division

STATUS: Planned

AVAILABILITY: Publication not yet available

*** NEW ***

BACKGROUND RESEARCH ON PHILANTHROPIC SUPPORT FOR AFFORDABLE HOUSING.

The recent Part IX research project entitled "The Role of Public-Private Partnerships (PPPs) in Producing Affordable Housing: Assessment of the U.S. Experience and Lessons for Canada" noted that philanthropies "... have been a critical participant in the development of the PPP affordable housing system in the U.S..." The project will address the considerable information gap with respect to the role that philanthropic support has played and could potentially play in the provision of affordable housing in Canada. The project will provide organizations involved in either creating or supporting the creation of affordable housing through PPPs with an understanding of the opportunities, as well as alternative ways and means of obtaining financial support from the gamut of potential donor sources in the philanthropic sector. The research is being managed under the direction of an advisory committee that includes members from the Canadian Housing Renewal Association's Board, the CCPPPH National Advisory Committee, a former Director of the Canadian Centre for Philanthropy, CMHC national office and field staff from the CCPPPH as well as Research Division.

CMHC Project Officer: David Metzak

CIDN: 2073 200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

HOUSING AFFORDABILITY

BLENDING INCOME HOUSING: LITERATURE REVIEW AND ANALYSIS.

The purpose of this project is to provide a summary of the range of housing, social and economic issues and thinking on income blended housing projects. It is a jointly funded CMHC-Revenue Canada initiative. An advisory committee composed of officials from both organizations is to oversee the conduct of the project. The final report will be of interest to third sector housing providers and homebuilders, as well as municipal and provincial officials. The first phase of the project will focus on the development of an analytical framework and will be used in the review of literature on blended income housing. Literature from Canada, the United States, Britain and other western industrialized countries will be reviewed in the second phase. Findings from the second phase will be analyzed so a comprehensive picture of the range of issues on income blending in housing projects can be presented.

CMHC Project Officer: David Scherlowski

CIDN: 1925 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

GUIDE TO AFFORDABLE HOUSING PARTNERSHIPS.

The purpose of this project is to prepare the content of a guide to creating affordable housing partnerships in Canada. The guide is intended to be used by individuals and organizations in the non-profit, public and private sectors who have an interest in providing affordable housing for families, single persons, seniors and people with disabilities. The publication will be of most use to organizations with less experience in partnering approaches to the provision of affordable housing. The guide is presently being prepared for publication and should be available during the first quarter of 1999.

CMHC Project Officer: Steve Mennill

CIDN: 1874 0200001

Division: Research Division

STATUS: Ongoing Project

*** NEW ***

AVAILABILITY: Publication not yet available

MARKET ANALYSIS AFFORDABILITY SOFTWARE PROJECT.

The objective of this project is to make modifications to Affordability to keep the software current with the latest technology; provide customization for interested clients/partners; create a fully functional Internet version should it be feasible; and provide technical support and expertise to help solve issues and problems that cannot be resolved by CMHC's help desk.

CMHC Project Officer: Greg Goy

CIDN: 1536 1000002

Division: Market Analysis Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSING AFFORDABILITY

MUNICIPAL REGULATION, LAND USE PLANNING AND FINANCIAL MEASURES FOR NEW AFFORDABLE HOUSING PRODUCTION.

The overall objective of this project is to raise awareness, primarily among planners, of the range of alternative regulatory (inclusionary zoning, density bonusing, alternative development standards), land use planning (performance based planning) and financial measures (exaction programs) that can be used by municipalities during the development approval process to implement new affordable housing. It is intended to identify and describe the range of alternative regulatory, land use planning and financial measures that can be used by municipalities to create new affordable housing. It is also intended to review initiatives that have been undertaken to implement affordable housing. This will be a study at the conceptual level of how the various measures interact and how they could be used together to encourage the creation of new affordable housing. In addition to being of benefit to planners, the project is expected to benefit homebuilders, land developers, third sector housing providers, as well as municipal finance officials.

CMHC Project Officer: David Scherlowski

CIDN: 2080 0200

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

MUNICIPAL REGULATORY INITIATIVES: PROVIDING FOR AFFORDABLE HOUSING.

This study examines regulatory initiatives - namely inclusionary zoning, "linkage" or other development fees, and density bonusing - associated with the development approval process that have been used to provide for housing affordable to lower-income households. The findings are presented primarily through detailed profiles of the activities of two dozen municipalities that have the most representative, productive or other relevant housing programs in the U.S. and Canada. These profiles reviewed the main regulations used in each of these programs, and their overall achievements to date. The report is expected to be of interest to planners, third sector housing providers and builders.

CMHC Project Officer: David Scherlowski

CIDN: 1670 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

THE NATURE, APPLICABILITY AND POTENTIAL OF HOUSING TRUST FUNDS IN CANADA

The objective of this project is to examine the nature and applicability of housing trust funds and the potential to establish them in Canada for the purpose of funding affordable housing development. The beneficiaries of this work will be municipal and provincial policy analysts, and finance officers, as well as non-profit and social housing providers.

CMHC Project Officer: David Scherlowski

CIDN: 2071 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

HOUSING AFFORDABILITY

THE ROLE OF PUBLIC-PRIVATE PARTNERSHIPS IN PRODUCING AFFORDABLE HOUSING: ASSESSMENT OF THE U.S. EXPERIENCE AND LESSONS FOR CANADA.

In order to strengthen and broaden current efforts to initiate affordable housing public-private partnerships (PPPs) in Canada, research was undertaken to examine the U.S. experience with public-private partnerships. The research found that the US approach to partnerships is "system-wide": it encourages widespread participation from corporations, philanthropies, foundations, lenders, financial investors, and the non-profit sector in producing affordable rental and home ownership housing. The report outlines a range of initiatives and mechanisms that have evolved in the US that work together to lever limited public-sector funds to produce affordable housing. The U.S. system works to reduce mortgage debt costs so that carrying costs are affordable and the housing is financially viable without the need for ongoing subsidy assistance. This report will be of interest to Canadian housing authorities, non-profit agencies and government housing policy makers interested in learning of alternative measures that could be used to support the provision of affordable housing in Canada.

CMHC Project Officer: David Metzack

CIDN: 1790 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SHELTER AFFORDABILITY AND HOUSING NEEDS OF CANADIAN FOOD BANK CLIENTS

The purpose of this research is to encourage an exchange of information on the substantive aspects of the project, Shelter Affordability and Housing Needs of Canadian Food Bank Clients.

CMHC Project Officer: John Engeland

CIDN: 1099 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Jeff A. Sloan, c/o Associate Professor, University of Manitoba
Nursing Research Institute, Faculty of Nursing
Winnipeg, Manitoba, R3T 2N2

AVAILABILITY: Publication not yet available

A STUDY OF THE RELIABILITY OF MEASUREMENT METHODS OF HOUSING AFFORDABILITY PROBLEMS.

The objective of this project is to examine the accuracy of responses to questions used in previous surveys and propose improvements to the survey questionnaire in advance of the launch of the surveys for the evaluation of the urban social housing programs.

CMHC Project Officer: Clark Wilson

CIDN: 1008 0502001

Division: Audit & Program Evaluation Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

HOUSING AFFORDABILITY

UPDATE TO THE REPORT, MUNICIPAL REGULATORY INITIATIVES: PROVIDING FOR AFFORDABLE HOUSING.

The objective of this project is to provide a comprehensive up-date to the present time of the 1995 report.

CMHC Project Officer: David Scherlowski

CIDN: 1670 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

HOUSING AND IMMIGRATION

IMMIGRANTS' GUIDE TO CANADIAN HOUSING.

The purpose of this project is to produce a guide that will assist immigrants in understanding Canadian housing and housing systems. The guide will include general information on Canadian housing as well as detailed information on how to obtain rental housing and how to buy a home. It will also provide information on contacts including government agencies and immigrant aid organizations. The substantive content for the guide is almost complete and publication is expected in mid-1999.

CMHC Project Officer: Steve Mennill

CIDN: 1802 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSING EXPORT OPPORTUNITIES

ADAPTING CANADIAN HOUSING TO INTERNATIONAL MARKET REQUIREMENTS.

The objectives of this project are to develop a qualitative and quantitative presentation on the extent of off-the-shelf versus adapted offerings of industry at present; develop a sector-by-sector picture of the feasibility of adaptation, based on considerations to be taken into account in each, and on specific case studies; and, develop a ranked list of practical steps which can be taken by Canadian industry to adapt to foreign customer requirements and expectations. Publication will be available early in 1999.

CMHC Project Officer: Rob Duncan

CIDN: 2008 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: David Crenna
82 Bayswater Avenue
Ottawa, Ontario, K1Y 2E9

AVAILABILITY: Publication not yet available

HOUSING EXPORT OPPORTUNITIES

ATTENDANCE AND REPORT ON THE ENERGY EFFICIENT RETROFITTING OPPORTUNITIES IN RUSSIA - BUSINESS BRIEFING.

The objective of this project is to attend, monitor, network and report on the Business Briefing concerning the Energy Efficient Retrofitting Opportunities in Russia to take place at the University of South California on Thursday, July 9/98.

CMHC Project Officer: Jeremy Melhuish

CIDN: 2057 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

CANADIAN/JAPANESE CONSTRUCTION COST ANALYSIS OF A TYPICAL 2X4 FRAMED HOUSE PLAN.

The purpose of this project is to develop a costing spreadsheet tool for use on all soft and hard costs forming part of the delivered turn key project including at minimum, design; permits and approvals; materials; etc.

CMHC Project Officer: Jay Thakar

CIDN: 1596 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CRITERIA TO HELP FORGE SUCCESSFUL CANADIAN HOUSING ALLIANCES.

The purpose of this project is to develop and validate criteria to help determine what makes alliances successful in the housing export market.

CMHC Project Officer: Louis Musto

CIDN: 1770 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSING EXPORT OPPORTUNITIES

EVALUATION OF CODES, REGULATIONS, DESIGN & BUILDING METHODS IN PRIORITY MARKETS (USA, RUSSIA, SOUTH KOREA, CHILE).

Canadian exporters of pre-packaged housing and components can compete in off shore markets if they can understand and access their market. Exporters must negotiate foreign markets, regulatory systems and familiarize themselves with local design practices and construction technologies, interpret the local vernacular and housing preferences and then market and distribute their product. The first step in managing these obstacles is to fully understand them so that strategies can be developed to overcome them. Some of this information has already been researched or is in the process of being researched by CMHC and other agencies such as DFAIT, NRCan and NRC. In other cases, especially in emerging markets, little information is available to guide exporters.

CMHC Project Officer: Rob Duncan

CIDN: 1949 0200002 (USA),
1949 0200003 (Russia),
1949 0200004 (South Korea),
1949 0200005 (Chile)

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publications not yet available

* NEW *

EXPORT HOME SEISMIC SLAB FOUNDATION.

The purpose of this project is to identify and develop a new seismic resistive foundation system for use in Japan, which could be "packaged" with Canada's housing technology and exports to create a value-added and thus more attractive export housing product.

CMHC Project Officer: Rob Duncan

CIDN: 2019 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Ian B. Bazley
32 Bello Road
Kelowna, British Columbia V1V 1C1

AVAILABILITY: Publication not yet available

EXPORT PERFORMANCE AND NEEDS OF THE CANADIAN MANUFACTURED HOUSING INDUSTRY.

The objective of this research is to develop a statistical profile and to identify the export performance and needs of the Canadian manufactured housing industry.

CMHC Project Officer: Louis Musto

CIDN: 1909 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

HOUSING EXPORT OPPORTUNITIES

FEASIBILITY STUDY ON AFTER-SALES SERVICES AND ESTABLISHMENT OF A WAREHOUSE FOR CANADIAN HOUSING EXPORTS IN JAPAN.

The objectives of this project are to identify existing programs for after-sales services; to provide options for after-sales services; to study Japanese laws and regulations governing the establishment of a warehousing facility in Japan by a foreign company; and to do a cost-benefit analysis for the recommended option.

CMHC Project Officer: Jay Thakar

CIDN: 2056 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

INDIA MARKET STUDY.

The purpose of this project is to study the market for the Canadian housing industry in India, i.e. manufacturers of products related to housing, prefabricated housing, on-site builders and renovators, and professional services.

CMHC Project Officer: Jay Thakar

CIDN: 2049 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

INTERNATIONALIZATION OF CANADIAN HOUSING SECTOR BUSINESSES: A PERCEPTUAL ANALYSIS.

The objective of this project is to conduct directed interviews with forty business executives throughout the country, working in three sub-sectors of the housing industry: professional construction services, housing manufacturers and product and material makers.

CMHC Project Officer: Joanne Hallée

CIDN: 1999 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: François Cadotte, FC Recherche
2238 Belgrave Avenue
Montreal, Québec H4A 2L8

AVAILABILITY: Publication not yet available

OPPORTUNITIES FOR CANADIAN FACTORY BUILT HOUSING IN THE SOUTHEASTERN UNITED STATES.

The purpose of this project is to identify the opportunities and impediments to the penetration of Canadian factory built housing in the southeastern United States.

CMHC Project Officer: Louis Musto

CIDN: 1953 0900002

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

HOUSING EXPORT OPPORTUNITIES

RETROFITTING RUSSIA'S HOUSING STOCK: OPPORTUNITIES AND OBSTACLES FOR CANADIAN EXPORTERS.

The purpose of this project is to identify several basic business development strategies which could be employed by Canadian firms to practically and realistically respond to the market opportunities represented by the Russian housing sector.

CMHC Project Officer: Oliver Drerup

CIDN: 1830 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

SEMINAR CURRICULUM ON THE CANADIAN HOUSING SYSTEM AND THE ESTABLISHMENT OF AN INTERNATIONAL TRAINING TEAM.

The objective of this project is to develop a seminar curriculum on the Canadian housing system to establish an international training team.

CMHC Project Officer: Louis Musto

CIDN: 1973 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SUSTAINABLE DEVELOPMENT IN CANADA.

The objective of this project is to investigate the application of Canadian sustainable development in the Japanese market.

CMHC Project Officer: Jay Thakar

CIDN: 2092 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSING MARKET

THE CHANGING NATURE OF WORK AND FUTURE HOUSING ASPIRATIONS OF CANADIANS: INTEGRATED FINAL REPORT.

This study explores some of the links between the labour market and housing. It identifies and explains the significant changes in working environments; analyses how these changes affect values and priorities with respect to housing and, consequently, demand for home ownership; and examines whether current home financing arrangements and underwriting criteria are responding to the changing nature of work.

Information was gathered through focus groups with members of the public in different employment arrangements and interviews with housing and finance industry professionals. The result was the development of three labour market scenarios from which projections for the future were extrapolated.

HOUSING MARKET

Prepared by Ekos Research Associates Inc. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Benoît Sanscartier. Ottawa: CMHC, 1998.

Order number: PE0304. **Price \$12.95 + GST and handling charges.

STATUS: Completed Report

AVAILABILITY: CMHC Information Products

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NOTE: Aussi disponible en français sous le titre: *L'évolution du marché du travail et les aspirations des Canadiens en matière de logement.*

EMPLOYMENT AND HOUSING ACTIVITY: A CYCLICAL ANALYSIS.

The objective of this project is to review the economic literature, prepare an estimation strategy, analyze the past cycles of retained employment indicators and estimate the elasticities of housing starts and MLS sales in relation to the employment indicators.

CMHC Project Officer: Louis Trottier

CIDN: 1952 1000002

Division: Market Analysis Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

THE IMPACT OF INHERITANCES ON THE HOUSING AND MORTGAGE MARKETS IN CANADA OVER THE NEXT 10 YEARS.

It is thought that with generally rising house values, improved financial and retirement planning, and with enhanced pension plans and government benefits, today's seniors are better off financially than their predecessors. This has led to questions about just how much of that wealth will be transferred to younger generations and about the potential impact which these transfers might have on the housing and mortgage markets in Canada.

This research report investigates and provides answers to the following questions:

- What is the extent of the wealth that has been accumulated by today's seniors?
- How much of this wealth will be transferred to younger generations?
- Who will be the recipients of the wealth transfer?
- What are the anticipated uses of future inheritances?
- What will be the impact of inheritances on the housing and mortgage markets?

HOUSING MARKET

The report concludes with an assessment of the projected impact on major stakeholders in the housing industry and mortgage markets - new home builders, the existing home resale market, mortgage lenders, renovators, building product manufacturers and suppliers, recreational property developers as well as mortgage insurers.

Prepared by Clayton Research Associates Limited. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officers: David Metzack and Tim Elliot. Ottawa: CMHC, 1998. 57 pages.

Order number: PE0307. **Price \$12.95 + GST and handling charges.

STATUS: Completed Report

AVAILABILITY: CMHC Information Products

P.O.Box 35005

Stn BRM B

Toronto, Ontario

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Telephone: 1-800-668-2642

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International clients see page 9 for order instructions

NOTE: Aussi disponible en français sous le titre: *Répercussions des successions sur les marchés hypothécaires et de l'habitation au Canada au cours de la prochaine décennie.*

RENTER TO BUYER: CMHC'S 27-YEAR HISTORICAL AFFORDABILITY REPORT 1970-1997.

This report is a special edition of CMHC's Canadian Housing Markets (CHM) report. Every year, the third quarter edition of CHM contains a detailed analysis of affordability for all major urban markets. In CHM, indicators are published for the latest three reporting periods. This report compiles and analyses the new information for the indicators for reporting periods back to 1970.

The purpose of this special edition is to provide housing industry participants with analyses of long-term affordability trends in Canada's major urban centres as they relate to home ownership.

Here is a unique examination of housing affordability patterns in 27 major housing markets, or census metropolitan areas, for the past 27 years. It includes a detailed time-series analysis of affordability trends and their major fluctuations, plus a comprehensive national overview of each of Canada's major local markets.

Both the national overview and a three-page report for each urban centre identify and analyse the forces that influence affordability. Together they succinctly describe the impact of changes in house prices, property taxes, heating costs, mortgage rates and renter incomes.

The analysis includes special tabulations on the demographic forces that influence local housing markets. Each local market report includes data on the number of households by tenure (renters aged between 20 and 44, all renters and all home owners). These are available for the Census years 1971, 1981, 1986 and 1991. All are based on 1986 Census boundaries.

Finally, each section examines the availability of new and resale housing that is priced with the means of average renters.

The report is in two parts. Part I is a national overview of local market affordability. Part II contains affordability reports for each of the country's 27 major housing markets. Both parts present insightful analysis of the forces that influence affordability, succinctly describing the impact of changes in house prices, and renter incomes.

HOUSING MARKET

The information for 1970 and annual data in the 1980s up to 1989 has never been released before.

Ottawa: Canada Mortgage and Housing Corporation, 1998.

Order number: NHA 2154. **Price \$39.95 + GST and handling charges.

STATUS: Completed Report

AVAILABILITY: CMHC Information Products

P.O. Box 35005

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NOTE: Aussi disponible en français sous le titre : *De locataire à acheteur*.

HOUSING SURVEYS

FIVE PILOT SURVEYS OF CONSUMER INTENTIONS TO BUY OR RENOVATE.

The objective of this project is to undertake and complete five pilot surveys of Consumer Intentions to Buy or Renovate.

CMHC Project Officer: Greg Goy

CIDN: 1587 1000003

Division: Market Analysis Centre

STATUS: Ongoing Project

*** NEW ***

AVAILABILITY: Publication not yet available

REVIEW OF DATA SOURCES AND INDICATORS.

The purpose of this project is to undertake a review of the major national data sources that include housing information which will assist in examining the role each might play in monitoring housing and community trends and developing related indicators.

CMHC Project Officer: Roger Lewis

CIDN: 1988 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SEASONAL ADJUSTMENT OF HOUSING STARTS TIME SERIES.

The objective of this project is to introduce reliable estimates of seasonally adjusted series at the beginning of the new year, at the time when all other CMHC survey data are revised and updated.

CMHC Project Officer: Michel Laurence

CIDN: 1967 1000002

Division: Market Analysis Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INFRASTRUCTURE

ALTERNATIVE METHODS OF FINANCING MUNICIPAL INFRASTRUCTURE.

This paper is the first in a series of three CMHC studies looking at infrastructure finance. The paper looks at the evolution of the issues, the challenges confronting municipalities, and different financing methods. The second and third papers in this series explore in more detail the potential for public-private partnerships, and demand-side management to fund the provision, operation and maintenance of municipal infrastructure. The papers will be available in April 1999.

CMHC Project Officer: David D'Amour

Division: Research Division

AVAILABILITY: Publication not yet available

STATUS: Ongoing project

*** NEW ***

PROVISION OF MUNICIPAL INFRASTRUCTURE THROUGH DEMAND MANAGEMENT: GUIDEBOOK AND CASE STUDIES

This paper is the second in a series of three CMHC studies looking at infrastructure finance. The paper looks at the ability of Demand Management (DM) measures to contribute to meeting future water and wastewater infrastructure demands. It will be available in April 1999.

CMHC Project Officer: David D'Amour

Division: Research Division

AVAILABILITY: Publication not yet available

CIDN: 1916 0200001

STATUS: Ongoing project

*** NEW ***

PUBLIC-PRIVATE PARTNERSHIPS IN MUNICIPAL INFRASTRUCTURE.

This paper is the third in a series of three CMHC studies looking at infrastructure finance. The paper explores the potential for public-private partnerships to fund the provision, operation and maintenance of municipal infrastructure. It will be available in April 1999.

CMHC Project Officer: David D'Amour

Division: Research Division

AVAILABILITY: Publication not yet available

CIDN: 1788 0200001

STATUS: Ongoing project

MORTGAGES AND HOUSING FINANCE

CHATTEL LOAN INSURANCE PROGRAM: EVALUATION REPORT.

This is the final report on the evaluation of the Chattel Loan Insurance Program (CLIP). The Chattel Loan Insurance Program, implemented in September 1988 for a five-year trial period, provided mortgage insurance on loans used to purchase manufactured housing located on land that was rented on a short term basis. CLIP was designed to improve access to affordable housing. CLIP facilitated the financing of mobile homes and in doing so began to place mobile homes on an equal footing with conventionally built houses.

CMHC was required to evaluate this program after the five-year experimental period. This report addresses the key findings and conclusions of the evaluation. The evaluation team found that there was both a need and a rationale for the program. The program met its objectives, albeit program take-up was limited. Other program

MORTGAGES AND HOUSING FINANCE

impacts and effects were found to be mainly positive. The evaluation team found that regularizing the program and removing some of the restrictions placed on it would be beneficial in most cases.

Prepared by: Audit and Evaluation Services, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
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NOTE: Aussi disponible en français sous le titre : *Programme d'assurance des prêts pour logements transportables : rapport d'évaluation.*

FEASIBILITY STUDY ON THE COMMERCIAL VIABILITY OF LAND-ONLY MORTGAGE LOAN INSURANCE.

To enable CMHC to better assess the potential demand for land-only mortgage loan insurance, the risks associated with offering land-only mortgage loan insurance and what means would be available to CMHC to mitigate those risks is being investigated.

CMHC Project Officer: Brian Ludlow

CIDN: 1891 0100001

Division: Strategic Planning, Policy and Marketing

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

MANAGING THE RISKS ASSOCIATED WITH A REVERSE EQUITY MORTGAGE (REM) LOAN INSURANCE PORTFOLIO.

The purpose of this project is to complete a study on the management of risks associated with an insured reverse equity mortgage (REM) portfolio.

CMHC Project Officer: Brian Davidson

CIDN: 1728 0100002

Division: Strategic Planning, Policy & Marketing

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

MORTGAGE AND INTEREST RATES MODELING AND FORECASTING.

The purpose of this research is to review and evaluate current approaches and practices to modeling and forecasting mortgage and interest rates, and to construct a set of models to provide CMHC with accurate forecasts of these rates.

CMHC Project Officer: Ali Manouchehri

CIDN: 1858 1000001

Division: Market Analysis Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

PERSONAL FINANCIAL MANAGEMENT FOR HOME OWNERSHIP IN TRANSITIONAL SOCIETIES.

The objective of this project is to contribute to the efficiency of the mortgage credit and housing markets of Visegard countries by evaluating the situation which has evolved since 1989 and by making recommendations on what might be done to improve the working of those markets. The project will enable the Canadian housing and financial industries to understand the challenges and opportunities confronting them when dealing with the Visegard markets.

CMHC Project Officer: Doug Dennis

CIDN: 1997 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Professor John L. Pratschke
Department of Consumer Studies
University of Guelph
Guelph, Ontario N1G 2W1

*** NEW ***

AVAILABILITY: Publication not yet available

PROSPECTS FOR, AND POTENTIAL IMPACTS OF RESIDENTIAL REAL ESTATE INVESTMENT TRUSTS (REITS).

The objective of this ERP project is to examine whether or not REITs reflect a financing mechanism that could improve the affordability and financial viability of either rejuvenating existing and/or constructing new rental housing in Canada. The study will summarize and evaluate the significant growth and use of residential REITs in the US. Responses to a survey of Canadian stakeholders involved in REITs (i.e. developers, property owners, existing residential REITs, lawyers and housing finance specialists) are to be presented reflecting their views on the future potential of REITs in Canada. This research will be of interest to property developers, residential rental real estate owners and investors as well as government housing policy makers interested in examining alternative ways and means of financing rental housing.

CMHC Project Officer: David Metzak

CIDN: 2011 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Tony Wellman
236 Royal Avenue
Ottawa, Ontario K2A 1T7

AVAILABILITY: Publication not yet available

PERSONS WITH DISABILITIES

ACCESSIBLE DOWNTOWN RESIDENTIAL COMMUNITIES: A CASE STUDY OF WINNIPEG, MANITOBA.

The purpose of this project is to examine housing and community design needs of persons with disabilities, including the elderly, to determine how these needs could be met in a downtown residential location as part of the revitalization of a downtown area.

CMHC Project Officer: Tom Parker

CIDN: 2017 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Nancy Klos, Institute of Urban Studies
University of Winnipeg, 346 Portage Avenue
Winnipeg, Manitoba R3C 0C3

AVAILABILITY: Publication not yet available

ADAPTING LOW-RISE RESIDENTIAL BUILDINGS.

Most walk-up apartment buildings constructed during the 1970s, 1980s and 1990s were not required by the building code to be barrier-free. However, the number of people with mobility, sight or hearing impairment is growing as our society ages, and the availability of suitable accommodation is limited. Recognizing this changing market, the Multi-family Council of the Saskatoon Home Builders' recommended the preparation of a manual to assist building owners and managers to make barrier-free renovation decisions. The Canada Mortgage and Housing Corporation has developed the Low-Rise Residential Barrier-Free Guide with the assistance of many professionals and organizations.

This guide has been designed to satisfy two needs. First, it identifies renovations that will create a barrier-free, three-storey walk-up apartment building. Second, it provides decision-making tools to help building owners and managers determine occupants' requirements, building suitability and the extent of renovations required to create a barrier-free living environment.

The first six chapters identify accessibility barriers that are common to three-storey walk-up apartment buildings. Modifications are suggested to remove or minimize these barriers. The chapter "Assessment Tools" identifies the basic level of service for tenants in each occupant group.

The "Looking Ahead" section at the end of each chapter provides renovation options that can be undertaken at the same time as regular maintenance activities. These low-cost options will make the building more accessible and livable for current and future occupants.

Prepared by: Sun Ridge Group (Saskatoon) for Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1998.

Order number: PE0292. **Price \$12.95 + GST + Handling Charges

STATUS: Completed Report

AVAILABILITY: CMHC Information Products

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NOTE: Aussi disponible en français sous le titre : *Adaptation des bâtiments résidentiels de faible hauteur.*

PERSONS WITH DISABILITIES

HOUSING DESIGN NEEDS OF DEAF PEOPLE.

This report examines the literature and other resources and documents and summarizes the current level of information on the housing design needs of deaf persons, and includes an annotated bibliography on this topic. The information examined is summarized to isolate significant factors of concern. Recommendations are made for further courses of action or areas in need of more investigation.

In preparing this report the literature in regards to the deaf and that in regards to barrier free design was searched. The legislation regarding barrier free design was consulted. Resources on the Internet were searched under the topics of "deaf" and "barrier free design" and related topics and likely looking "hits" were "surfed". People and associations who would be likely to have information were contacted.

Deaf people, for the most part, live in homes designed for the general population. Adaptations are made to meet their unique needs. Homes that are designed specifically with the needs of the deaf in mind are not common.

Prepared by Henry Vluc, Canadian Association of the Deaf. Prepared for Canada Mortgage and Housing Corporation. CMHC Project Officer: Tom Parker. Ottawa: CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre : *Les besoins des sourdes en matière de conception de logements.*

HOUSING NEEDS OF PEOPLE WITH DISABILITIES.

The objective of this project is to provide a profile of the housing characteristics and needs of people with disabilities using data from the 1991 Census and post-censal Health and Activity Limitations Survey (HALS).

CMHC Project Officer: Jamie Angus

CIDN: 1045 0200003

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PERSONS WITH DISABILITIES

MAJOR MAINTENANCE AND RESIDENTIAL RENOVATION: A SURVEY OF MEANS TO IMPROVE THE ARCHITECTURAL ACCESSIBILITY OF EXISTING BUILDINGS.

The objective of this project is to study the extent to which it is possible to integrate architectural accessibility into existing residential buildings during major maintenance or common renovation work planned by an owner.

CMHC Project Officer: Sophie Bang, Succursale de Montreal

CIDN: 2021 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Sophie Lanctôt, c/o Société Logique Inc.
3250, boul. St-Joseph Est
Montréal, Quebec H1Y 3G2

*** NEW ***

AVAILABILITY: Publication not yet available

NARRATIVES ON DEDICATED AND INTEGRATED HOUSING ALTERNATIVES.

The purpose of this project to conduct 3 focus groups (10 in each focus group) with consumers of mental health services residing in self-contained units in three housing settings. These housing settings have off-site support staff.

CMHC Project Officer: Luis Rodriguez

CIDN: 1452 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Katherine M. Boydell, Queen Street Mental Health Centre
1001 Queen Street West
Toronto, Ontario, M6J 1H4

AVAILABILITY: Publication not yet available

AN OUTLOOK ON MENTAL HEALTH CONSUMERS HOUSING NEEDS.

The objective of this research is to examine the supportive housing needs of the severely chronically mentally ill in the Manitoulin-Sudbury District by location and by language, culture and gender.

CMHC Project Officer: Teresa van den Boogaard

CIDN: 1852 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Geneviève Gibbons, Canadian Mental Health Association
111 Elm Street
Sudbury, Ontario, P3C 1T3

AVAILABILITY: Publication not yet available

PERSONS WITH DISABILITIES

SPACE EFFICIENT UNIVERSAL DESIGN INNOVATIONS.

The objective of this project is to evaluate design innovations which have been developed specifically to enhance access for people who use wheelchairs.

CMHC Project Officer: Tom Parker

CIDN: 2009 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Gloria Gutman
Gerontology Research Centre, Simon Fraser University
2800-515 West Hastings Street
Vancouver, British Columbia V6B 5K3

AVAILABILITY: Publication not yet available

* NEW *

PROPERTY MANAGEMENT

CURRENT CONDITIONS IN THE RESIDENTIAL PROPERTY MANAGEMENT INDUSTRY.

This project is intended to result in a profile of the residential property management industry. It will contain statistical and descriptive information on the size and concentration of the industry, the roles and responsibilities of the key players, and any available data on how the industry is positioned internationally. It is intended to focus on a number of social and economic topics associated with residential property management. Results of the project will determine the nature and depth of associated information gaps and research needs. The project will be of interest to residential property managers.

CMHC Project Officer: David Scherlowski

CIDN: 1966 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

REGULATORY REFORM

ACT IN ACTION: AFFORDABILITY AND CHOICE TODAY -- LESSONS LEARNED.

Affordability and Choice Today (ACT) is a federally funded program that encourages municipalities and the housing sector to work in partnership to conceive, test and implement changes to the existing web of building and development regulations. The project report which was just published looks at a number of projects completed under the program. It identifies elements in each that have led to positive changes. In doing so, it gives decision-makers the information they need to assess, not only the value of alternative approaches, but also their relevance and transferability to their communities.

CMHC Project Officer: David Scherlowski

CIDN: 1571 0200001

Division: Research Division

STATUS: Completed Report

* NEW *

REGULATORY REFORM

THE EVALUATION STUDY OF THE AFFORDABILITY AND CHOICE TODAY (A.C.T.) PROGRAM.

The Affordability and Choice Today (ACT) Program, initiated in 1990, was designed to encourage the private and non-profit housing sectors to work in partnership with municipalities to develop, test and promote regulatory innovation that can help to improve housing affordability and choice. It addressed a complex infrastructure of bylaws, agreements, zoning, variances and standards established by local and provincial governments to protect the interests of local residents, property owners and governments.

The evaluation examined whether the ACT Program continued to address an actual need (i.e. program relevance) and whether it was effective in meeting its objectives (i.e. program success). This report addresses the key findings and conclusions of the evaluation.

Prepared by Audit and Evaluation Services, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642, Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre : *Étude d'évaluation du programme Abordabilité et choix toujours (ACT).*

LEVYING DEVELOPMENT COST CHARGES ON A SQUARE-FOOT BASIS: CASE STUDY = L'ÉTABLISSEMENT DES DROITS D'AMÉNAGEMENT AU PIED CARRÉ : ÉTUDE DE CAS.

Development cost charges (DCCs) are applied by municipalities to help offset new capital costs created by new development. Capital costs include the costs of construction and expansion of capital facilities (e.g. roads, sewers, or park land), as well as related planning, engineering and legal costs. DCCs can represent a sizable portion of the cost of producing a new home. The basis for levying DCCs can significantly influence housing form. Municipalities in many provinces have usually charged DCCs on a flat-fee lot or unit basis, which does not take into account the size of a lot or dwelling. When development costs increase in direct relationship to the number of units created, a greater number of smaller homes become more expensive to build than fewer, larger homes. In this way, the flat-fee approach may discourage the production of modest-sized housing that is affordable to a growing number of one- and two-person households.

Alternatively, charging DCCs on a square-foot basis can contribute directly to greater housing affordability and choice. This approach can balance the financial incentive, or imperative, to build large lots and dwellings, in order to encourage the development of smaller lots and dwellings. In this way, the square-foot approach can contribute to keeping both land and housing prices affordable to single- and low-income earners, and those living on fixed-incomes, such as seniors.

The Urban Development Institute (UDI) Pacific Region presented the idea of charging DCCs on a square-foot basis to municipalities in the Greater Vancouver area. The municipalities requested a technical and legal analysis before proceeding any further. UDI was awarded an A.C.T. grant in 1992 to undertake this analysis.

REGULATORY REFORM

develop a square-foot model for levying DCCs, and produce a model by-law. The project team's research suggests that levying DCCs per square foot presents the best solution to providing developers with an incentive to build a mix of housing sizes where it is possible to define a specified area or sector; allocate land use and density; and determine a likely population estimate for the area.

Affordability and Choice Today (A.C.T.) Streamlined Approval Process Project / Urban Development Institute Pacific Region Vancouver, British Columbia. Prepared by Energy Pathways Inc. Prepared for: Federation of Canadian Municipalities, Canadian Home Builders' Association, Canadian Housing and Renewal Association, Canada Mortgage and Housing Corporation. Ottawa: The Federation; The Associations, CMHC, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
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Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
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NOTE: Bilingual/bilingue.

1998 ASSESSMENT OF THE AFFORDABILITY AND CHOICE TODAY (ACT) PROGRAM.

The objective of the project is to assess the ACT program to assist CMHC Senior Management in its decision to extend, modify or discontinue the program. It will also recommend future directions for the program to enhance its relevance, success and cost-effectiveness. The study method will involve a hybrid data collection strategy consisting of a review of ACT project files, a fax-out/fax-back survey of 150 key participants in ACT projects as well as 150 industry representatives and municipal officials from non-ACT communities, and 10 structured information interviews with ACT program managers and management committee members. As a follow-up to the formal evaluation undertaken in 1995, the study will determine the success with which the recommendations from that evaluation were implemented.

CMHC Project Officer: Susan Fisher

CIDN: 2059 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

* NEW *

ORCHARD NEIGHBOURHOOD: A MODEL FOR COMMUNITY ARCHITECTURE = ORCHARD NEIGHBOURHOOD: UN MODÈLE DE SOCIO-ARCHITECTURE.

Community involvement as a fundamental component in residential development is gaining increasing attention. Homeowners and community planners are seeking ways to successfully involve residents in defining development goals and criteria for their neighbourhoods. While it is generally accepted that input from local residents during planning and development is desirable, input in many communities may be limited to reaction. Plans are drawn up and community members are asked to respond. The term "community architecture" refers to the process of bringing residents and planners together in partnership to address the development needs of a neighbourhood from the outset. Residents, rather than planners or developers, take the lead role in determining the acceptable criteria for future neighbourhood development. This requires residents to be active in the planning process, rather than simply reacting to proposed plans and regulatory amendments at public hearings. This community-based approach was used to develop recommendations for a 12-block area in the

REGULATORY REFORM

Town of Sidney, located on Vancouver Island in British Columbia. The residential area is a relatively old, established community referred to as "Orchard Neighbourhood" for the purposes of this project.

Humanité Services Planning (B.C.) Ltd. received an A.C.T. grant in 1992 to proceed with a project that aimed to achieve three main goals: define a planning process that would involve the community, facilitate the development of innovative and affordable housing, retain the character of the neighbourhood. The project included a survey of homeowners in the area, an information meeting and a community workshop. Based on this input, the project team developed several key recommendations focusing on the formal structure and planning process for community-based planning. One recommendation called for homeowners in the 12-block area to incorporate a society representing the interests of Orchard Neighbourhood. The creation of the "Orchard Neighbourhood Society" (ONS) proved an essential step in achieving community-based planning. Municipal staff recommended changes to the Town's Official Community Plan, by-laws, regulations and the approval process to make the ONS an officially recognized and integral part of the development process. Other recommendations related to encouraging innovative design and a variety of housing types and options provided they complement the existing character of the neighbourhood; creating development guidelines; and making specific street, lane, pedestrian crossing and traffic control improvements.

Affordability and Choice Today (A.C.T.) Streamlined Approval Process Project Town of Sidney, British Columbia. Prepared by: Humanité Services Planning (B.C.) Ltd. Prepared for: Federation of Canadian Municipalities, Canadian Home Builders' Association, Canadian Housing and Renewal Association and Canada Mortgage and Housing Corporation. Ottawa: The Federation; The Associations; The Corporation, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation
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Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
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NOTE: Bilingual/bilingue.

REGULATORY OBSTACLES TO INNOVATIVE HOUSING.

Healthy housing, an inclusive approach to developing housing that is environmentally, socially and economically responsible, calls for innovation and is potentially one of the most important challenges facing policy makers, municipal authorities, design professionals and the building industry today. All innovation in a highly regulated field, including housing development and construction, is constrained by existing laws, codes and policies.

This report documents the regulatory obstacles encountered in the development of seven unconventional healthy housing projects undertaken across Canada between 1992 and 1997. The report highlights the Vancouver Healthy House (Vancouver, BC), the Alberta Sustainable Home/Office (Calgary, AB), the Armour-Crainford House Renovation, (North York, ON), the Toronto Healthy House (Toronto, ON), the Innova House (Kanata, ON), the North Mountain House (Arlington, NS), and the Slatkoff-Boisclair House and Studio (Gore, QC). In addition, information is provided from brief reviews of 14 other homes with innovative features.

REGULATORY REFORM

Prepared by Habitat Design + Consulting and Archemy Consulting Ltd. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Mark Holzman. Ottawa: CMHC, 1998. 58 pages

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NOTE: Aussi disponible en français sous le titre : *Obstacles réglementaires à l'innovation en habitation.*

REVIEW OF PERFORMANCE-BASED ZONING, TOWN OF MORINVILLE, ALBERTA: CASE STUDY = EXAMEN DU ZONAGE BASÉ SUR LE RENDEMENT, VILLAGE DE MORINVILLE (ALBERTA) : ÉTUDE DE CAS.

In 1996, the Town of Morinville investigated the current state of the art in alternatives to traditional zoning, and how they could be applied in smaller communities such as their own. Morinville needed to update its Municipal Development Plan to bring it into conformity with the province's new Municipal Government Act. In addition, the Town was discussing a joint venture development proposal from a local group. They envisaged a high tech community built on the Town's land, in a joint public/private sector project. "Cyberlanes Estates" would be designed for home-based businesses and professionals, with advanced telecommunications and information technologies, and a business centre with offices, meeting rooms, and a media studio. The community was to be designed to the latest standards in both construction and planning, including sustainability, environmental sensitivity, security, crime prevention and new community resources.

However, their innovative plans were beyond the scope of existing zoning standards for most municipalities. Traditional zoning identifies acceptable uses and dimensions - which can be very restrictive for new uses, or for mixed-use projects. Performance zoning is designed to allow much more flexibility, by identifying acceptable ways of dealing with intensity and impacts, instead of rigid use restrictions.

Morinville and representatives of Cybercity Developments Inc. applied for an A.C.T. grant to investigate performance standards and performance-based planning, develop and compare alternative approval process models including cost-benefit analysis, discuss alternatives with focus groups and report to town council with recommendations and proposals for implementation.

Unfortunately, even though the Town was supportive, the proposal for Cyberlanes Estates did not proceed, so the consultant could not do a specific cost-benefit examination of traditional and performance-based planning tools for the project. Instead, more general principles were identified.

The final report identified pros and cons of the performance-based planning approach. It concluded that some hybrid system of performance and prescriptive zoning is probably the best answer. A pure performance-based model is not recommended, but some key elements would be very useful for the Town's future development.

In fact, the Town's Land Use Bylaws were being consolidated while this A.C.T. project was under way. The mayor reports that the examination of zoning purposes, impacts and alternatives helped produce consensus for increased flexibility in the new bylaws.

REGULATORY REFORM

This report's recommendations also will be considered during the Town's municipal development plan review.

Affordability and Choice Today (A.C.T.) Regulatory Reform Project. Prepared by: Rowena E. Moyes. Prepared for: Federation of Canadian Municipalities, Canadian Home Builders' Association, Canadian Housing and Renewal Association, Canada Mortgage and Housing Corporation. Ottawa: The Federation; The Associations; CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
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K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Bilingual/bilingue.

RENTAL HOUSING

FEASIBILITY OF CREATING A CANADIAN MULTIPLE-UNIT RENTAL HOUSING DATA BASE.

The objective of this project is to assess the feasibility of developing a Canadian multiple-unit rental housing database. To that end, the following four questions will be addressed: (i) Should CMHC initiate the development of a multiple-unit data base? (ii) What opportunities would there be to partner with other organizations? (iii) Should a Canadian initiative be linked in some way with the U.S. effort being managed by the Multifamily Housing Institute? and, (iv) What are the options for proceeding?

CMHC Project Officer: David Scherlowski

CIDN: 2095 0200

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

THE PRIVATE RENTAL HOUSING SECTOR AND ITS NEW CLIENT GROUP

A review of the literature (including research on the Internet) will be aimed at identifying approaches and programs targeting harmonious relations between landlords and their new client group.

CMHC Project Officer: Benoit Sanscartier

CIDN: 1648 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Luba Serge
29 Easton Street
Montreal, Quebec H4X 1K9

AVAILABILITY: Publication not yet available

RENTAL HOUSING

RENTERS AND THEIR HOUSING CONDITIONS: FROM THE 1980s INTO THE 1990s.

The purpose of this project is to examine how and why the circumstance of renter households changed over the last fifteen years, with special focus on housing conditions, and the social and economic factors associated with changes in the level and nature of housing need.

CMHC Project Officer: John Engeland

CIDN: 1582 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

REVIEW OF METHODS GOVERNMENTS HAVE EMPLOYED TO SUPPORT PRIVATE RENTAL HOUSING.

In the current fiscal environment, the federal and provincial governments have limited resources to use in directly supporting the availability of affordable rental housing and must rely on the private sector to achieve this objective. As part of CMHC's efforts to enhance and broaden the understanding of rental housing, this project examines alternative programs and policies employed by governments internationally to support private rental housing, particularly those programs and policies intended to improve the quality, prolong the life or increase the supply of such housing. The review will cover the U.S., U.K., Western Europe, Scandinavian countries, Australia and Japan. This project will be of interest to property developers, private rental landlords and investors, the construction and renovation industry, mortgage lenders and insurers as well as federal and provincial housing policy analysts.

CMHC Project Officer: David Metzack

CIDN: 1885 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

UNDERSTANDING PRIVATE RENTAL HOUSING INVESTMENT IN CANADA.

The project will investigate rental housing investment in Canada and establish a basis from which public and private decision makers can clearly understand the environment for investment in, and development of, rental housing.

CMHC Project Officer: Tim Elliot

CIDN: 1748 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RESIDENTIAL DEVELOPMENT

ALTERNATIVE PLANNING AND REGULATORY APPROACHES USED IN OTHER COUNTRIES.

The purpose of this study is to investigate and document international approaches to planning and development regulation, specifically, the use of performance based planning and financial/economic incentives. These approaches may offer useful lessons and insights in improving the flexibility and effectiveness of the development environment in Canada. In addition to existing documentation, the research will be based on interviews with government, development and academic informants in Australia, New Zealand, the United States and Europe. The information gathering stage of this project is complete and a report is being drafted for publication next year.

CMHC Project Officer: Steve Mennill

CIDN: 1775 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

COMMUNITY DESIGN: AN ANALYSIS OF DENSITY MEANINGS AND DEVELOPMENT OF A DESIGN TOOL.

This research addresses how Land Use Density stipulations can impact and/or interplay with various other system components (such as open space) of community plan-making. It will result in a Sustainable Community Design Tool component that will inform the process of "negotiated urban design" in arriving at midrange density prototypes acceptable to the broad community.

CMHC Project Officer: Doug Pollard

CIDN: 1998 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: William T. Perks
William Perks Professional Services & Brooke Associates Collaborative
201908 17th Avenue
Calgary, Alberta, T2S 2S2

* NEW *

AVAILABILITY: Publication not yet available

CRITICAL SUCCESS FACTORS ENABLING ALTERNATIVE RESIDENTIAL DEVELOPMENT STANDARDS.

The purpose of this project is to study innovative examples of the application of alternative development standards. It will determine what the critical success factors are to enable the new standards to be implemented.

CMHC Project Officer: David D'Amour

CIDN: 2006 020001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Teresa Paul
10937-79th Avenue
Edmonton, Alberta, T6G 0P1

AVAILABILITY: Publication not yet available

RESIDENTIAL DEVELOPMENT

THE ECONOMIC IMPACT OF SECONDARY SUITES ON URBAN INFRASTRUCTURE & SERVICES.

The purpose of this research is to investigate and summarize different approaches for determining the municipal servicing costs, both capital and operating, of secondary suites in established neighbourhoods and new subdivisions, through a literature review and key interviews.

CMHC Project Officer: Steve Mennill

CIDN: 2010 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Vanessa Geary
Tenants Rights Action Coalition
2681 East Hastings
Vancouver, British Columbia V5X 1Z5

*** NEW ***

AVAILABILITY: Publication not yet available

INCREASING URBAN DENSITIES TO ACCOMMODATE POPULATION GROWTH.

This project examines the issue of urban density in order to deal with population growth pressures, taking into account public policy and regulations, private development decisions, and urban form, with a view toward projecting the implications of growth in terms of built form, land consumption, infrastructure, and the distribution of housing.

CMHC Project Officer: Fanis Grammenos

CIDN: 1844 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Gerald Daly, Daly & Associates
Box 139, RR #4, Flesherton
Ontario, N0C 1E0

AVAILABILITY: Publication not yet available

THE INFORMATION REVOLUTION AND RESIDENTIAL DEVELOPMENT.

The objective of this research is to examine residential development within the context of the information revolution.

CMHC Project Officer: Benoit Sanscartier

CIDN: 2014 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Pamela Blais
182 Crawford Street
Toronto, Ontario M6J 2V6

AVAILABILITY: Publication not yet available

RESIDENTIAL DEVELOPMENT

RESIDENTIAL INTENSIFICATION IN CENTRAL DISTRICTS.

The objective of this research is to examine the phenomenon of residential intensification in a dense urban sector using data on the new housing built there in the last five years and on the new residents of those dwellings. The study will focus on the Mile End neighbourhood of Montreal with the view to drawing lessons for the renewal of central districts in other Canadian cities.

CMHC Project Officer: Mark Holzman

CIDN: 2012 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Jocelyn Duff, Habitat sur mesure
4626 Bordeaux Street
Montreal, Quebec, H2H 2A1

AVAILABILITY: Publication not yet available

RESIDENTIAL STREET DESIGN: LEARNING FROM SUBURBIA.

The purpose of this research project is to generate concrete residential street design solutions based upon a thorough understanding of precedents, and introduce and stimulate new ideas for land developers and design professionals.

CMHC Project Officer: Fanis Grammenos

CIDN: 1644 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Sevag Pogharian , Sevag Pogharian Design
4643 Sherbrooke Street West, Suite 12
Montreal, Quebec, H3Z 1G2

AVAILABILITY: Publication not yet available

ROOFTOP GARDENS

ROOFTOP AND VERTICAL GARDENS: IDENTIFYING OPPORTUNITIES AND BARRIERS TO WIDESPREAD USE.

The purpose of this project is to develop a Canadian "status report" on rooftop and vertical gardens.

CMHC Project Officer: Susan Fisher

CIDN: 2005 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Steven Peck
35-859 Millwood Road
Toronto, Ontario, M4G 1W7

AVAILABILITY: Publication not yet available

SENIORS

ANALYSE DES DÉPLACEMENTS DE PERSONNES SOUFFRANT DE LA MALADIE D'ALZHEIMER DANS UN CENTRE D'ACCUEIL.

The growth in the number of seniors with Alzheimer's dementia (AD) represents a major issue in health policies requiring, among other things, that buildings be designed for this client group. With specific knowledge of the residual capacities and limitations of persons with AD, appropriate environmental interventions can be performed. This research project constitutes a step towards understanding the ability of persons with AD to move around in their familiar environment. Conducted in a nursing home, the project was carried out in two stages. First, interviews with the workers allowed for the documentation of residents' habits and the difficulties encountered during their movements. Then, a direct observation of residents with AD was performed along a predetermined path. The observations revealed spatial orientation difficulties among persons with AD, despite the familiarity of the environment in which they live. However, some architectural structures remain identifiable by this client group. It follows that, for persons with AD to be able to orient themselves within buildings, these buildings must meet certain criteria such as a clear identification of the functions of each room, a definite distinction between the various environments crossed, either with architectural elements or interior design features. As well, the monotony encountered, in long corridors for example, forces users to discriminate details, and this is beyond the capacities of persons with AD.

Prepared by Romedi Passini, Hélène Pigot, Constant Rainville, Marie-Hélène Tétreault, and Yves Joannette. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Luis Rodriguez. Ottawa: CMHC, 1997 (External Research Program).

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
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Tel.: 613-748-2367 or 1-800-668-2642
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ASSESSMENT OF PHASE I OF THE BENNY FARM RE-DEVELOPMENT PROJECT.

This research will determine the effectiveness of the approach taken by CMHC to relocate the residents of the Benny Farm Project and find out how well the new housing meets the residents' current and future needs and preferences for accommodations.

CMHC Project Officer: Luis Rodriguez

CIDN: 1751 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SENIORS

A FLEXIBLE REGULATORY TOOL: MODEL GARDEN SUITE BYLAW: CASE STUDY = UN OUTIL DE RÉGLEMENTATION FLEXIBLE : MODÈLE DE RÉGLEMENT SUR LES PAVILLONS-JARDINS : ÉTUDE DE CAS.

Many Canadian municipalities are looking for ways to provide seniors with appropriate and affordable housing. One municipality, the City of Cowansville, Quebec, is especially interested in the garden suite as a viable alternative to institutional living for independent seniors requiring some support and assistance. The City's Building and Planning Department was awarded an A.C.T. grant in autumn 1994 to create a model bylaw governing garden suites. One impetus for the project was the City's view that existing municipal planning regulations, such as current zoning bylaws, were too rigid to ensure project quality, particularly with respect to the siting and architectural integration of garden suites into established residential neighbourhoods. The goal of this A.C.T. project was to develop a flexible regulatory instrument with which municipalities could effectively manage the installation of new garden suites and the conversion of existing accessory buildings into garden suites. The model garden suite bylaw which resulted from the project provides building permit applicants and municipal decision-makers with evaluation objectives and criteria, as well as an approval process designed specifically for garden suite projects.

The project consisted of four phases: the review and analysis of existing regulatory tools for garden suites in Quebec and elsewhere in Canada; the classification, according to municipal concerns, of the objectives and criteria used in the regulatory models examined in the first phase; the drafting of a model garden suite bylaw containing objectives and criteria which meet the specific needs of the City of Cowansville; and the refinement of the model garden suite bylaw, following consultation with interested parties.

The results of this A.C.T. project will interest other Canadian communities wishing to encourage the development of this innovative housing choice for seniors. The architectural design and site planning objectives and criteria prepared for this A.C.T. initiative were specifically designed both to facilitate the integration of garden suites into existing residential areas and to meet the particular needs of seniors. Municipalities will therefore find the objectives and criteria contained in the draft garden suite bylaw especially useful in evaluating garden suite projects.

Affordability and Choice Today (A.C.T.) Streamlined Approval Process Project. Building and Planning Department Cowansville, Quebec. Prepared by: Julie Tasker-Brown. Prepared for: Federation of Canadian Municipalities, Canadian Home Builders' Association, Canadian Housing and Renewal Association, Canada Mortgage and Housing Corporation. Ottawa: The Federation; The Associations; SCHL, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642, Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Bilingual/bilingue.

HOME ENVIRONMENTS AND FALLS BY SENIORS.

The purpose of this project is to determine the significance of environmental factors that are likely to cause falls among independent and active seniors living in their own homes within the territory of the Québec Urban Community.

CMHC Project Officer: Luis Rodriguez

CIDN: 1843 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Benoît Lévesque
Centre de santé publique de Québec
2050 René-Lévesque Blvd.
Sainte-Foy, Quebec G1V 2K8

AVAILABILITY: Publication not yet available

HOUSING FOR OLDER CANADIANS.

The objective of this project is to produce a comprehensive guide to planning, designing, developing, managing and marketing housing for older Canadians.

CMHC Project Officer: Luis Rodriguez

CIDN: 0869 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

HOUSING OPTIONS FOR PEOPLE WITH DEMENTIA.

The objective of this project is to produce an illustrated and practical publication documenting innovative housing options for people with dementia.

CMHC Project Officer: Luis Rodriguez

CIDN: 1251 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

INTERVENTION MODELS: SAFETY IN CASES OF EMERGENCY OF PERSONS WITH REDUCED MOBILITY AND SENIORS LOSING THEIR INDEPENDENCE LIVING IN REGULAR RESIDENTIAL ENVIRONMENTS

This study is aimed at integrating current knowledge and reflections concerning the problems associated with the safety of seniors and persons with disabilities living in regular residential environments, in order to apply them to the development of intervention models for three multiple-family buildings equipped with elevators.

CMHC Project Officer: Luis Rodriguez

CIDN: 460 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Sylvie Quintin, Société d'habitations communautaires logique inc.
3250 St-Joseph Blvd. East, Montreal, Quebec H1Y 3G2

AVAILABILITY: Publication not yet available

SENIORS

LIVING AT HOME OR IN A RESIDENCE: A CHALLENGE FOR SENIORS AND WORKERS

The objective of this project is to examine, in Quebec's Saguenay area, the circumstances, constraints, limitations and difficulties encountered by clients who receive home care and the organizations that provide it.

CMHC Project Officer: Luis Rodriguez

CIDN: 1641 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Danielle Maltais
Université du Québec à Chicoutimi
555 de l'Université Blvd.
Chicoutimi, Quebec
G7H 2B1

AVAILABILITY: Publication not yet available

PLANNING HOUSING AND SUPPORT SERVICES FOR SENIORS.

The objective of this project is to produce a new and improved version of the current CMHC publication "Maintaining Seniors Independence in Rural Areas: A Guide to Planning for Housing and Support Services" (NHA 6298).

CMHC Project Officer: Luis Rodriguez

CIDN: 1780 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PREDICTING THE ADJUSTMENT OF ELDERLY PERSONS TO CONGREGATE CARE HOUSING.

The purpose of this project is to undertake research to complement the conventional post-occupancy studies which tend to emphasize assessing the housing environment rather than the well-being of individual occupants.

CMHC Project Officer: Glynis Kossatz

CIDN: 1827 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Dr. Robert Gifford, Optimal Environment Inc.
2311 Edgelow Street
Victoria, British Columbia, V8N 1R6

AVAILABILITY: Publication not yet available

SENIORS

THE PRIVATE RENTAL MARKET: ADAPTING TO THE NEEDS OF AGING TENANTS.

This research will identify the extent to which landlords in the private rental market across Canada are accommodating the needs of aging tenants, and describe and develop measures that would help landlords deal more effectively with tenant needs.

CMHC Project Officer: Luis Rodriguez

CIDN: 1996 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Kathleen Mancer, DKM Housing Consultants
141-6200 McKay Avenue
Burnaby, British Columbia, V5H 4M9

AVAILABILITY: Publication not yet available

PRIVATE RETIREMENT HOME RESOURCES IN QUEBEC.

The objective of this project is to evaluate the safety and functionality of non-institutional private retirement home designs in Quebec with regard to frail senior clients who could present cognitive deficiencies.

CMHC Project Officer: Jean-François Dion, Québec Branch Office

CIDN: 1846 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Daniel Pelletier
Université Laval, Pavillon Charles-de-Koninck, Cité universitaire
Sainte-Foy, Quebec G1K 7P4

AVAILABILITY: Publication not yet available

USER SATISFACTION STUDY OF HOUSING OPTIONS FOR OLDER CANADIANS.

The objective of this research is to carry out user satisfaction studies of some of the newer housing options that are currently available to older Canadians, and to produce an objective and detailed report based on the results of the research.

CMHC Project Officer: Luis Rodriguez

CIDN: 1583 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

USING THE LAND TRUST MODEL TO FACILITATE AN INTEGRATED DEVELOPMENT: ST. ALBERT PROJECT: DOCUMENTATION AND ANALYSIS.

The Communitas Group Inc. are assisting seniors in St. Albert to build affordable housing designed specifically for seniors. The approach combines a community-based land trust with a resident-financed model. Residents contribute equity toward the development to reduce financing costs. A land trust separates ownership of the land from the properties, and helps to maintain long-term affordability. The land trust is also important in phasing in the development to include an initial phase of self-contained apartments and subsequent phases of bungalows and an assisted-living complex.

SENIORS

With the financing package and establishment of the land trust complete, the construction was scheduled to begin in the spring of 1998. While developed for seniors, the model is adaptable to any client group. It is necessary that a majority of the participants have access to equity and are able to commit a considerable amount of time on a voluntary basis. Although the initial members who contribute equity to the project are taking on a degree of risk, this is offset by a price discount and the opportunity to have a direct involvement in decisions that affect the quality and design features of the development.

The initiative has noted the importance of pre-development funding. While it was able to access the CMHC Proposal Development Funding to finance initial development costs, the proponents also recommend the development of other forms of seed funding to assist groups in overcoming the high front end costs of initiating a project.

Submitted to Homegrown Solutions by the Communitas Group Ltd. Ottawa: Canada Mortgage and Housing Corporation, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
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NOTE: Aussi disponible en français sous le titre: *Utilisation du modèle de fiducie foncière pour faciliter l'aménagement d'une collectivité intégrée.*

SOCIAL HOUSING

DEVELOPING A PROFILE OF MARKET RENTERS LIVING IN SOCIAL HOUSING.

This study sought to develop a profile of market renters living in social housing developed under the N.H.A. 56.1 program and to identify potential differences between market tenants living in social housing and market tenants living in comparable private rental buildings. Included in the analysis is an assessment of the differences across the two groups in terms of their: household characteristics, their current and previous housing situation, their perceptions of community, their support service requirements, their plans for the future including potential for home ownership and their overall satisfaction with their current housing situation. A total of 779 households were surveyed across private non-profit, municipal non-profit and private rental housing and the differences were analyzed to determine whether there were differences which could be considered to be statistically significant across those living in social housing and those living in private rental housing.

Prepared by: Lorraine Copas, Community Focus. CMHC Project Officer: Patricia Streich. Ottawa: Canada Mortgage and Housing Corporation, 1998. (CMHC External Research Program).

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642, Fax.: 613-748-4069
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SOCIAL HOUSING

HOME BUSINESS IN SOCIAL HOUSING: A POLICY AND PROGRAM IMPLEMENTATION STRATEGY.

The purpose of this report is to identify the elements of a policy and program to permit and encourage the development of home businesses in a social housing setting. The report identifies roles and responsibilities for various housing stakeholders, and the relationships among them and with non-housing partners to make such a policy and program a reality. The report also identifies the manner in which social housing residents can achieve self-sufficiency through home businesses and the types of resources and support required for them to do so.

Prepared by David Bruce. Prepared by Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Phil Deacon. Ottawa: CMHC, 1998. (External Research Program).

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
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URBAN TRANSPORTATION

THE IMPACT OF URBAN FORM AND TRAVEL ACCESSIBILITY UPON PRIVATE VEHICLE TRAVEL.

The purpose of this study is to measure the influence of land use patterns and urban form on household travel demand and behaviour.

CMHC Project Officer: Susan Fisher

CIDN: 1752 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

METHODOLOGY TO ASSESS TRANSPORTATION GREENHOUSE GAS EMISSIONS FROM URBAN TRAVEL.

The purpose of this study is to compare the greenhouse gas (GHG) emissions from personal urban transportation given variations in community planning and design variables such as density and land use mix. The final product will be a quantitative tool that would be used by CMHC and its clients to evaluate development proposals for GHG emissions from private automobile use.

CMHC Project Officer: Susan Fisher

CIDN: 2041 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

*** NEW ***

WOMEN & HOUSING

CHRONIC HOMELESSNESS AMONG WOMEN: A DECADE OF CHANGING NEEDS AND SERVICES.

This research will constitute a retrospective review of the changing patterns of women's homelessness in the Toronto area. It will focus on chronically homeless women and innovative services, based on the observations and expertise of those who have worked closely with homeless women over the past decade (1987-1997).

CMHC Project Officer: Brenda Baxter

CIDN: 2000 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Sylvia Novac
593A Melita Crescent
Toronto, Ontario
M5G 3Y7

AVAILABILITY: Publication not yet available

*** NEW ***

INVESTIGATION OF ISSUES FOR THE EVALUATION OF THE NEXT STEP PROGRAM.

The purpose of this project is to conduct a literature review on second-stage housing for the Next Step Program.

CMHC Project Officer: Patricia Streich

CIDN: 1507 0500001

Division: Audit and Program Evaluation Services

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

WOMEN'S HEALTH AND WELL-BEING FROM A HOUSING PERSPECTIVE.

The objective of this project is to undertake and complete the study on the "State of Women and Their Housing: 1997," which develops a profile of women and their health and well-being from a housing perspective.

CMHC Project Officer: Tom Kerwin

CIDN: 1615 0100001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

YOUTH & HOUSING

GIMME SHELTER: SHARING SUCCESSES IN HOUSING FOR YOUTH: CMHC HOUSING AWARDS FORUM: FORUM HIGHLIGHTS.

Canada Mortgage and Housing Corporation (CMHC) organized a two-day forum in 1997, GIMME SHELTER: Sharing Successes in Housing for Youth, to celebrate and promote the accomplishments of many organizations working with youth to provide more housing choices for youth.

More than half the participants at the Forum were youth. Of 148 peoples, 80 were 15-30 years old. The Forum, held in Montreal from October 22 to 24, provided an opportunity to exchange ideas about housing and living environments for youth. It served as a consultation with youth about practical solutions and best practices in housing to meet the needs of young people.

It brought together youth who had stories to share about housing projects and programs they have found meaningful and helpful to them. It included urban planners, environmentalists, housing industry representatives, members of housing agencies and co-operatives, students, teachers, researchers, and government representatives. Everywhere, people were talking, sharing, and telling their stories, the focus being on housing for youth.

Various types of presentations (theatrical, research, experiential, dramatic readings) and workshops gave people many opportunities to think about the issues. Among those dealt with were access to information, financial barriers (such as employment and economic issues, credit references, rent subsidies), discrimination, safety, accessibility, affordability and youth's lack of experience in securing housing for themselves. Participants also learned about housing construction education programs for youth, which not only help youth learn basic residential development and construction skills, but also contribute to developing team-building and communication skills. Partnerships, sustainable housing, and youth involvement in housing design, operation and management were other areas explored.

Participants proposed many solutions. Key ones were networking, partnerships and creating youth-friendly, supportive environments. But even more significant is ensuring that youth are actively involved in initiatives from the outset, beginning with the planning stage.

Prepared for CMHC by Sharon Margison of Communication Dynamics, with assistance from Nicole Jasmin of Nicole Jasmin Consulting; and Sophie Edwards, Consultant. Ottawa: Canada Mortgage and Housing Corporation, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre: *Enfin chez moi! Partager les réussites : le logement pour les jeunes.*

YOUTH & HOUSING

GIMME SHELTER: HOUSING FOR YOUTH: CMHC HOUSING AWARDS: SHARING SUCCESSES IN HOUSING FOR YOUTH.

This portfolio contains information sheets on the 16 projects chosen by the Awards Selection Committee featured at the CMHC Housing Awards Forum. All offer practical solutions to challenges facing youth. They also demonstrate ways in which youth themselves are involved in addressing issues, in cooperation with others. Many organizations have found that they best meet the needs of youth by offering holistic services, including training, employment opportunities, support for continuing one's education, counselling and, particularly with Aboriginal youth, by working to connect youth with their community and traditional roots.

Ottawa: Canada Mortgage and Housing Corporation, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre: *Enfin chez moi : habitation jeunesse : prix d'excellence en habitation de la SCHL - partager les réussites : le logement pour les jeunes.*

HOUSING CANADA'S YOUTH.

The objective of this project is to develop social, economic, and demographic profiles of youth with an in-depth review of their current and past housing conditions, and identification and assessment of housing issues and trends into the future. The youth and rental repair studies should be out by the end of the year.

CMHC Project Officer: Roger Lewis

CIDN: 1786 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

YOUTH & HOUSING

MORE GREAT HOUSING PROJECTS FOR AND BY YOUTH: 1997 CMHC HOUSING AWARDS: SHARING SUCCESSES IN HOUSING FOR YOUTH.

This 27 page document presents descriptions of 47 entries in the awards competition. Categories covered include:

- alternative housing tenures
- community housing initiatives
- financing
- housing design
- housing for youth at risk
- housing for youth with disabilities
- information/education/rights/finding housing
- training/employment

For each entry listed there is a brief description of the project with a contact listed for more information.

Ottawa: Canada Mortgage and Housing Corporation, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre: *D'Autres excellentes initiatives de logement réalisées par et pour les jeunes.*

"OUT FROM THE SHADOWS" - INTERNATIONAL SUMMIT OF SEXUALLY EXPLOITED YOUTH.

The purpose of this project is to gain knowledge regarding the housing-related options which can help address the key factors contributing to commercially, sexually exploited youth and the main obstacles to alleviating such circumstances.

CMHC Project Officer: Teresa van den Boogaard

CIDN: 1921 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BIBLIOGRAPHIES

- Alternative mortgage instruments / Nouveaux modes de financement hypothécaire
(Rev. 15 p., October/octobre 1984)
- Architecture in Canada / L'architecture du Canada
(18 p., July/juillet 1983)
- Building and climatic factors / Construction et des éléments climatiques
(7 p., November/novembre 1983)
- Building in cold climates / Construction dans les pays froids
(Rev. 9 p., December/décembre 1989)
- Building laws / Législation de la construction
(Rev. 25 p., October/octobre 1986)
- Building materials / Matériaux de construction
(14 p., August/août 1987)
- Building product information / Information sur les produits pour le bâtiment
(7 p., August/août 1984)
- Children in the urban environment / Les enfants dans le milieu urbain
(23 p., January/janvier 1993)
- Cohousing / Habitation communautaire
(8p., July/juillet 1996)
- Computer-aided architectural design / Dessins architecturaux par ordinateur
(Rev. 2 p., September/septembre 1984)
- Condominium conversion / Immeubles d'habitation - transformation en copropriétés
(12 p., May/mai 1986)
- Condominiums / Copropriétés
(Rev. 12 p., March/mars 1986)
- Congregate housing / Habitat collectif
(10 p., November/novembre 1991)
- Construction industry in Canada / Industrie de la construction au Canada
(Rev. 27 p., January/janvier 1988)
- Construction industry labour / Main-d'oeuvre de la construction
(6 p., February/février 1988)
- Cooperative housing / Coopératives de logements
(Rev. 40 p., September/septembre 1988)
- Crime prevention and architectural design / Design architectural et prévention
de la criminalité (7 p., May/mai 1989)
- Crime prevention and urban safety in residential environments / La prévention
du crime et la sécurité dans les milieux résidentiels urbains (12 p., September/septembre
1989)

- Deinstitutionalization
(7 p., June/juin 1988)
- Desktop Publishing
(3 p., March/mars 1988)
- Development rights transfer / Transfert de droits de développement
(8 p., December/décembre 1985)
- Discrimination and segregation in housing in Canada / Bibliographie sur la discrimination
et la ségrégation dans le logement au Canada (5 p., November/novembre 1991)
- Downtown redevelopment / Réaménagement de centres-villes
(Rev. 26 p., January/janvier 1989)
- Earthquakes and construction / Tremblements de terre et construction
(20 p., March/mars 1995)
- Energy conservation in multiple housing / Économie d'énergie dans les logements collectifs
(Rev. 3 p., June/juin 1983)
- Examples of housing program evaluations / Exemples d'évaluations de programmes
de logement (3 p., January/janvier 1982)
- Expandable housing / Les logements expansibles
(October/octobre 1985)
- Experimental houses / Maisons expérimentales
(6 p., January/janvier 1983)
- External Research Program Reports arranged by subject / Rapports du programme
de recherche à l'extérieur par sujet (Rev. 56 p., September/septembre 1997)
- False Creek, Vancouver, British Columbia / False Creek, Vancouver,
Colombie-Britannique (Rev. 4 p., November/novembre 1984)
- Federal/provincial relations and housing / Relations fédérales/provinciales
et le logement (3 p., June/juin 1987)
- Foundations / Fondations
(17 p., January/janvier 1989)
- Geodesic domes / Domes géodésiques
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- Graduated payment mortgages / Prêts hypothécaires à paiements progressifs
(Rev. 3 p., October/octobre 1991)
- Group homes / Foyers de groupe
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- Halfway houses / Foyers de groupe
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- Home care vs institutional care / Soins à domicile ou en établissement
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- Home equity conversion / Conversion de la valeur nette du logement
(9 p., October/octobre 1988)

- Home ownership / La propriété d'un logement
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- *Homelessness / Sans-logis
(Rev. 61 p., June/juin 1998)
- House designs - annotated / Modèles de maisons - annotée
(12 p., June/juin 1984)
- Housing and AIDS / Hébergement des personnes atteintes du SIDA
(5 p., September/septembre 1993)
- Housing and services for the disabled / Logement et les services pour les handicapés (Rev. 68 p., April/avril 1992)
- Housing and the elderly / Le logement et les personnes âgées
(Rev. 78 p., September/septembre 1988)
- Housing conversion and residential intensification / Conversion d'habitations et intensification résidentielle (Rev. 8 p., October/octobre 1990)
- Housing costs / Prix des maisons
(12 p., August/août 1985)
- Housing demand / La demande en logement
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- Housing density / Densité d'habitation
(7 p., September/septembre 1985)
- Housing for immigrants and minorities / Logement pour les groupes ethniques et immigrants (7 p., May/mai 1993)
- Housing for single parent families / Le logement et les familles monoparentales
(Rev. 6 p., May/mai 1986)
- Housing for single people / Le logement et les personnes seules
(3 p., September/septembre 1984)
- Housing in Canadian municipalities / Logement dans les municipalités canadiennes (Rev. 44 p., March/mars 1985)
- Housing in New Brunswick / Logement au Nouveau-Brunswick
(7 p., March/mars 1987)
- Housing in Newfoundland / Logement à Terre-Neuve
(6 p., March/mars 1987)
- Housing in Nova Scotia / Logement en Nouvelle-Écosse
(11 p., May/mai 1987)
- Housing in Prince Edward Island / Logement dans l'Île-du-Prince-Édouard
(4 p., April/avril 1987)
- Housing in the Atlantic Provinces / Logement dans la région de l'Atlantique
(4 p., April/avril 1987)
- Housing in urban core areas / Logement dans les centres-villes
(Rev. 13 p., January/janvier 1985)

- Housing management / Gestion des logements
(Rev. 23 p., January/janvier 1989)
- Housing markets / Le marché du logement
(Rev. 36 p., January/janvier 1988)
- Housing policy in Canada / Politique du logement au Canada
(Rev. 45 p., January/janvier 1987)
- Housing quality / Qualité de logement
(8 p., January/janvier 1988)
- Housing renovation / Restauration de quartiers résidentiels
(Rev. 62 p., March/mars 1988)
- Housing stock / Stocks d'habitations
(8 p., February/février 1987)
- Housing subsidies / Subventions au logement
(Rev. 49 p., October/octobre 1990)
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(4 p., March/mars 1982)
- Impact of inflation on house prices / Effets de l'inflation sur le prix des maisons
(Rev. 5 p., February/février 1995)
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(Rev. 29 p., July/juillet 1990)
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- Low energy housing / L'habitation à consommation réduite d'énergie
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- Mortgage insurance / L'assurance hypothécaire
(11 p., April/avril 1988)
- Mortgages / Hypothèques
(Rev. 21 p., August/août 1984)
- Municipal energy management / Gestion de l'énergie dans les municipalités
(Rev. 10 p., September/septembre 1983)
- MURBs and RHOSPs / IRLMs et REELs /
(4 p., April/avril 1986)
- Native housing / Logement pour autochtones
(20 p., January/janvier 1988)
- Neighbourhood improvement programs / Programme d'amélioration des quartiers
(8 p., May/mai 1982)
- Neighbourhood preservation / Conservation du quartier
(6 p., May/mai 1982)
- Noise / Le bruit
(27 p., December/décembre 1991)
- Non-profit housing / Le logement à but non-lucratif
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- Playgrounds / Terrains de jeux
(Rev. 30 p., December/décembre 1991)
- Post occupancy evaluation / Évaluation après occupation
(13 p., February/février 1989)
- Privatisation of Public/Council Housing in Great Britain
(6 p., June 1987)
- Program evaluation / L'évaluation de programme
(Rev. 17 p., October/octobre 1986)
- Property tax / L'impôt sur la fortune
(7 p., February/février 1985)
- Proposal writing / Rédaction de projets
(5 p., August/août 1988)

- Public housing in Canada / Habitations à loyer modéré au Canada
(Rev. 63 p., September/septembre 1991)
- Public/Private Partnerships / Association du secteur public et du secteur privé
(12 p., December/décembre 1989)
- R-2000 bibliography / Bibliographie sur R-2000
(7 p., September/septembre 1987)
- Radon and houses / Radon dans les habitations
(Rev. 23 p., July/juillet 1990)
- Railway relocation / Déplacement de voie ferrée
(6 p., October/octobre 1982)
- Real estate in Canada / Propriété immobilière au Canada
(Rev. 37 p., September/septembre 1987)
- Real property appraisal / Évaluation de la propriété immobilière
(12 p., April/avril 1984)
- Reinsurance / Réassurance
(3 p., July/juillet 1987)
- Rent control / Contrôle des loyers
(Rev. 20 p., August/août 1990)
- Rental housing / Logement locatif
(53 p., October/octobre 1990)
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(6 p., December/décembre 1983)
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*Youth and Housing / Les jeunes et le logement

(20 p., November/novembre 1998)

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Anti-carbonation Coatings for Use on Canadian Buildings

Appareils de combustion de bois et qualité de l'air intérieur

Assessment of the Indoor Air Quality of a Suite for an Environmentally Hypersensitive Occupant

Before You Renovate

Building Adaptability: A Survey of Systems and Components

CMHC's Healthy House in Toronto

Canadian Response to Urban Governance Survey: OECD Group on Urban Affairs

The Community/Privacy Trade-Off in Supportive Housing: A Qualitative Study of Consumer Preferences

A Comparative Study of Immigrant Housing, Neighbourhoods and Social Networks in Toronto and Montreal

Construction Standards for Accessory Suites

Development & Testing of Floor Drain with a Valve to Block Sewer Gas for Residential Applications

Directory of Sources of Support for Canada's Housing Exporters

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Estimating the Concentrations of Soil Gas Pollutants in Housing: A Step-By-Step Method

Evaluation of Housing Initiatives Under the National Strategy for the Integration of Persons with Disabilities

Evaluation of Pollutant Source Strengths and Control Strategies in Conventional and R-2000 Houses

Expanding the Korean Market for Residential Wood-Frame Construction

Feasibility Study for a Survey of Consumer Intentions to Buy or Renovate

Field Investigations of Indoor Environment and Energy Usage in Mid-rise Residential Buildings

Garden Suites Pilot Project: Case Study

Guiding Applicants Through the Approval Process

Habitation et flexibilité au Canada : Bilan 1991 : La flexibilité vue par les architectes

Homebuying Step By Step: A Consumer Guide and Workbook

Home Occupation Scenarios and Their Regulatory Requirements: A Case Study

Housing Needs of the Environmentally Hypersensitive: Socio-economic/Health Factors

Housing Needs of the Metis People

Legalization of Secondary Suites in Surrey, B.C.: Case Study

Light, Site Density and Form: A Study of Daylight Availability in Canadian Residential Buildings

Literature Review: Aboriginal Peoples and Homelessness

Macroeconomic Impacts of the Housing Sector

Mediation as a Tool to Resolve Land-Use Disputes: How Kamloops Integrated Mediation Into Its Land Development Approval Process

Mount Pearl Residential Intensification Study

Neighbourhood Group Homes for the Elderly: The Planning, Design and Development Process

New Ways to Create Affordable Housing: Results of a National Survey of Housing Providers

Overheating as a Factor in House Design

Passive Monitoring of VOC in Air Using ACC

A Place to Go: An Evaluation of the Next Step Program for Second-Stage Housing in Canada

Planning and Managing Traffic Noise on Urban Roads: International and Canadian Experience

Planning Cohousing

Planning Study of Native Northern Communities

Portable Pneumatic Lift Seat

The Potential for Water Efficiency Improvements in Multi-family Residential Buildings in Canada

“RORO” Modular Home Shipping System

Radon: A Guide for Canadian Homeowners

Regulatory Barriers to On-site Water Reuse

Residualization of Rental Tenure: Attitudes of Private Landlords Towards Housing Low Income Households

Second Dwelling Units in Rural and Village Settings

Seniors Helping Seniors with Rural Housing: Final Report

Serviceability of Floor Systems with Wood-I-Joists and Concrete Topping

Small-Lot Single Family Infill Housing: Case Study

Study of Home Adaptations Carried Out Under the RRAP-D and HASI Programs: Final Report

Sustainability in Practice: Reducing Construction Waste in the Ontario Residential Construction Industry

Two-Generational Housing

Urban Brownfields: Case Studies for Sustainable Economic Development: The Canadian Example

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Current Housing Research

Volume 6, n° 1





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Volume 6
Number 1
1999



Issued also in French under the title: *Recherches courantes sur l'habitation*

Publié aussi en français sous le titre: *Recherches courantes sur l'habitation*

CURRENT HOUSING RESEARCH ORDER FORM

If you wish to receive any of the completed reports or bibliographies listed, or if you would like to be on the mailing list to receive *Current Housing Research*, please fill out this form and send it to:

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INTRODUCTION

Welcome to "*Current Housing Research*". This publication merges "*Housing Research Quarterly*" and "*Current Housing Technology Initiatives*" and continues the numbering of the "Housing Research Quarterly".

Under Part IX of the National Housing Act the Government of Canada provides funds to Canada Mortgage and Housing Corporation to conduct research into the social, economic and technical aspects of housing and related fields.

Current Housing Research is compiled and produced three times a year by the Canadian Housing Information Centre. This publication provides information and access to research which is undertaken and sponsored by the Corporation. It is also available on CMHC's Website at chic@cmhc-schl.gc.ca

The publication contains information on completed research reports, new publications, videos and bibliographies, as well as planned and ongoing research projects. An alphabetical title index of items listed is included at the end for quick reference.

The overall arrangement of "*Current Housing Research*" is by broad subject category. Within each subject category, lists of planned and ongoing projects and completed research reports are described.

Each entry can contain the following elements:

- The project or report title;
- A description of the project or report results;
- The CMHC Project Officer who is managing the project;
- The Division within CMHC which is responsible for the project;
- For External Research Projects, the grant recipient undertaking the research;
- A Contract Identification Number (CIDN);

- The Status of the project: whether the project is in a planned, ongoing or completed phase. "Planned Projects" are those that are not yet underway, but are likely to be initiated in the current year. "Ongoing Projects" refer to research projects which are currently underway. No reports are yet available. Once the project is completed, and a report is available for distribution, it will be listed as a "completed report."

- Whether the report resulting from the research project is available and the address where the completed report can be obtained.

To discuss research projects that are recent or ongoing, please call CMHC General Inquiries at (613) 748-2000 and ask for the CMHC Project Officer identified under each project description.

CMHC's External Research Program

The objective of the CMHC External Research Program (ERP) is to encourage and enable researchers in the private and not-for-profit sectors to put forward and carry out relevant, innovative, and high quality housing research projects. Under the Program, financial contributions are made to support research investigations into important questions, problems, and issues affecting Canadian housing. Housing research priority areas are identified in the "External Research Program Grants for Housing Research Guidelines and Application Form".

Applicants to the External Research Program must be Canadian citizens or have permanent resident status in Canada.

Independent researchers as well as those employed in Canadian universities, institutions, private consulting firms, the professions and the housing industry may apply for these grants.

Full-time students at the graduate or undergraduate level are not eligible to apply. Students may be hired to assist in the conduct of the research, but under no circumstances may they take over responsibility for the direction of the work or the quality of the final report.

Individuals who are full-time federal, provincial or municipal government employees may apply. However, to be eligible, an applicant must provide a letter of support from her/his employer which shows that the proposed research is not part of, and will not interfere with, her/his regular work. CMHC employees are not eligible to receive grants under this Program.

CMHC is interested in receiving applications on topics related to its housing research priority areas. New ideas and innovative approaches in these areas are welcome.

To obtain the booklet outlining the priority research areas, the guidelines and application form for the External Research Program you may contact:

The Administrator
CMHC External Research Program
Research Division
Canada Mortgage and Housing Corporation
700 Montreal Road, Room C7-307
Ottawa, Ontario
K1A 0P7

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NOTE TO INTERNATIONAL CLIENTS

The "*Current Housing Research*" cites research reports and priced publications. **Availability and place of ordering varies with the type of report.**

PRICED PUBLICATIONS

Publications with prices listed in the "*Current Housing Research*" are available for sale to international clients. Prices are payable in Canadian dollars. Orders can be placed and the exact price, with shipping and handling, can be obtained from the following address:

CMHC Information Products
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Tel.: 613-748-2003
Fax: 613-748-2016

RESEARCH REPORTS

Research reports are listed without a price in the "*Current Housing Research*". They are free to Canadian residents. However, to recover some of our distribution costs there is a fee to mail research reports to locations outside of Canada. The price for research reports mailed to destinations in the United States is \$10.00 for each report. The price for research reports mailed to destinations in other countries is \$15.00 for each report. Prices are payable in Canadian dollars. Research reports can be ordered from the address listed below:

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700 Montreal Road
Ottawa, Ontario
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Fax.: 613-748-4069
Internet: chic@cmhc-schl.gc.ca

TECHNICAL RESEARCH

FIRST NATIONS BUILDERS' TRAINING.

This project was developed in partnership with the Ontario First Nations Technical Services Corporation. The product was a set of technical training materials relevant for First Nations communities. The three day curriculum includes a trainer's manual and a participant handbook containing sections on building envelopes, mechanical systems, flooring, walls and roofs. As well, the curriculum contains leading edge information on wood heating, slab-on-grade and shallow frost-protected preserved wood foundations. The curriculum has been successfully used in several training sessions in Ontario and Saskatchewan.

CMHC Project Officer: Alain Croteau

CIDN: 1750 0300002

Division: Assisted Housing Division

STATUS: Completed

AVAILABILITY: Publication available in conjunction with training sessions.

ACOUSTICS

IMPACT ANALYSIS OF INDUSTRIAL NOISE ON SURROUNDING RESIDENTIAL SECTORS: A PICTURE OF THE SITUATION FOR THE BEAUCE AND QUEBEC AREAS.

The research project is aimed at describing the current situation regarding the impact of industrial noise, with the testing being performed in the Quebec and Beauce areas, two regions where there are many industrial parks adjacent to residential sectors.

CMHC Project Officer: Sandra Marshall

CIDN: 1845 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Jean-Gabriel Migneron, Université Laval
1636 Pavillon Félix-Antoine-Savard
Quebec, Quebec G1K 7P4

AVAILABILITY: Publication not yet available

NOISE ISOLATION PROVIDED BY EXTERIOR WALLS IN WOOD CONSTRUCTION.

The External Research Program of Canada Mortgage & Housing Corporation accepted the proposal by MJM Acoustical Consultants Inc. to conduct a study on the noise isolation provided by exterior walls in wood construction.

At the time the proposal for this research project was submitted, the acoustical data available on exterior walls was almost non-existent. The main objective of this project was to fill this void by investigating the sound attenuation properties of four exterior walls commonly used in Canadian low cost residential housing.

A total of nine Sound Transmission Loss measurements were conducted on the four exterior walls selected: two walls with 38 mm x 140 mm (2" x 6") studs and two with 38 mm x 89 mm (2" x 4") studs. Five tests were carried out on walls with no exterior finishes, and four on walls with PVC cladding. All the wall compositions selected had a thermal insulation factor of RSI 3.5 (R20). In order to establish the effect of varying the stud spacing, one sound transmission loss test was performed on a wall whose studs were spaced 600 mm (24") apart; the rest of the specimens were constructed with studs spaced at 400 mm (16") o.c. which is presently the stud spacing most often used for exterior walls in Canadian construction. The interior finish was the same for all the walls tested: 13 mm (1/2") drywall located on the receiving room side (the large reverberation chamber). The exterior side of the wall was located on the source room side.

Prepared by Michel Morin, MJM Acoustical Consultants Inc. CMHC Project Officer: Ken Ruest. Ottawa: Canada Mortgage and Housing Corporation, 1998. (External Research Program).

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

BASEMENTS, FOUNDATIONS & CRAWLSPACES

BASEMENT WALLS THAT DRY.

Research has shown that finished basement walls, with chronic wetting, produce molds dangerous to human health. This research suggests that no basement with a history of dampness should be finished until the moisture problems are completely remedied. This project tested theoretically quick-drying basement wall systems, in hopes of being able to recommend these systems for marginal basements. They were subjected to a mid-wall leak and a 10 cm flood to measure the drainage and drying characteristics. A final report is in preparation. Only two of the ten wall types tested showed good drying response after wetting by leakage and flooding.

CMHC Project Officer: Don Fugler

CIDN: 1797 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

IMPROVED BASEMENT PERFORMANCE.

Concerns have been expressed by a number of authorities about the quality of construction of new basements. Technical and cost issues pertaining to the overall performance of poured-in-place concrete basements will be examined. The Canadian Standards Association (CSA), with CMHC and industry support, will improve the standard CAN3-A438-M84: Concrete Construction for Housing and Small Buildings. This standard addresses requirements for poured-in-place concrete basements. Several task groups are working to update this standard.

CMHC Project Officer: Don Fugler

CIDN: 1259 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

LATERAL BRACING OF FOUNDATION WALLS.

At the request of the Alberta Housing Industry Technical Committee (AHITC) this study was initiated to investigate the structural adequacy of typical concrete residential foundation walls to resist lateral earth pressures.

The study objectives were to include a review of the adequacy of current construction practices to resist lateral earth pressures. Both 8'-0" (2.44m) high and 9'-0" (2.74m) high concrete foundation walls were examined subject to four different backfill pressure intensities, and various backfill heights. Then, based on the results of the investigation, the second objective was to develop detailed, generic, practical, and cost effective solutions of lateral bracing details for the top of wall connections, where such details are required. These lateral bracing details were to be applicable to both conventionally framed and wood I-joist floor systems.

Overall the scope of the project was limited to typically constructed, residential concrete foundation walls 8" (200mm) thick by either 8'-0" (2.44m) or 9'-0" (2.74m) high. Maximum sidewall and endwall dimensions of 60'-0" (18.3m) and 30'-0" (9.14m) respectively were assumed. As well, deviations in the wall including short angled walls, beam pockets, areas adjacent to stairwell openings and areas surrounding large windows were studied. Based on the results of the study, a number of interesting points were revealed:

1. The recommended lateral earth pressures are significantly higher than the building code specified minimum value.
2. The nominal strength of the concrete wall is substantial and therefore vertical reinforcement may not be required in many situations; however for high backfills, suggestions for reinforcement are made.
3. The industry standard practice for top of wall connections is in general not adequate to resist the calculated lateral forces. Recommendations for improving this connection are made.
4. The use of short angled walls and beam pockets to laterally stabilize the wall were found to be neither practical nor effective ways to provide the required support.
5. The effects of window openings in the wall and stairwell openings adjacent to the wall were examined and recommendations for local reinforcement around these areas are provided, as well as lateral bracing requirements each side of such areas.

BASEMENTS, FOUNDATIONS & CRAWLSPACES

*Prepared by Kelly Grubb, Bearden Engineering Consultants Ltd. CMHC Project Officer: Darrel R. Smith.
Prepared for Research Division, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1998.*

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

PERFORMANCE GUIDELINE DEVELOPMENT FOR BASEMENT SYSTEMS AND MATERIALS.

CMHC is a participant contributing research to this multi-disciplinary, multi-agency study led by the National Research Council identifying knowledge gaps in the performance of basement systems. Guidelines will be developed for design, construction and evaluation of basement materials and systems to ensure their durability and long-term performance. Field work is largely complete. The reports on various aspects are being written.

CMHC Project Officer: Don Fugler

CIDN: 1421 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SLIDE PRESENTATIONS ON TWO FOUNDATION TYPES AND TO MONITOR THE PERFORMANCE OF THE EXAMPLES OF THE TWO FOUNDATION SYSTEMS.

The purpose of this project is to undertake and complete the development of two slide presentations and the monitoring of two foundations over a one-year period.

CMHC Project Officer: Tom Kerwin

CIDN: 1813 030000

Division: Research Division

STATUS: Ongoing Project

BUILDING CODES & STANDARDS

THE FUTURE OF CANADIAN STANDARDS FOR RESIDENTIAL CONSTRUCTION.

The objective of this project is to build on the March/97 report of the Joint Task Force of the Canadian Commission on Building and Fire Codes/Provincial/Territorial Committee on Building Standards (PTCBS/CCBFC) by documenting recent changes in standards specifically related to the housing industry.

CMHC Project Officer: Doug Pollard

CIDN: 2027 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

ADJUST-A-FORM.

The objective of this project is to develop ideas for adjustable, reusable forms. Specifically the project includes the inception to the development of a specific product ready for marketing. The end result will be a product that saves builders time and material and therefore project costs.

CMHC Project Officer: Darrel Smith

CIDN: 1501 0200001

Division: Research Division, Housing Technology Incentives Program

STATUS: Ongoing Project

Grant Recipient: Raymax Construction Limited
1038 Lesperance Road
Tecumseh, Ontario, N8N 1W8

AVAILABILITY: Publication not yet available

BUILDING AND RENOVATING WITH SALVAGED MATERIALS: A REUSE WORKPLAN.

The objective of this project is to develop and test design procedures and specification guidelines in the form of a workplan by which design professionals and builders can effectively salvage and reuse materials in building projects including demolition and renovation or new construction at a residential scale.

CMHC Project Officer: Darrel Smith

CIDN: 2023 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Mark Poddubiuk, Pearl Poddubiuk Architects
995 Girouard
Montreal, Quebec H4A 3B9

AVAILABILITY: Publication not yet available

COMPRESSED EARTH BLOCK CONSTRUCTION.

The objective of this project is to officially approve the material "earth", to allow architects, builders and self-builders to make use of earth construction.

CMHC Project Officer: Chris Ives

CIDN: 2004 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Ginette Dupuy-Gouin
5920 Louis-Hémon
Montreal, Quebec H2G 2K6

AVAILABILITY: Publication not yet available

INFORMATION ON DURABILITY AND SERVICE LIFE OF BUILDING ELEMENTS AND EQUIPMENT.

A Delphi study is currently underway to collect information from property managers, property management firms and experts in differing fields such as ventilation systems, elevators, walls, parking garages, etc., to determine, from their experience, the service life of these elements. The study is expected to provide data on building elements which in some cases would have low or high durability variances. Follow-up research could then be undertaken to investigate why those building elements have these high variances.

CMHC Project Officer: Ken Ruest

CIDN: 1915 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PERFORMANCE OF BOX BEAMS.

The objective of this project is to review the design specifications, production, assembly, and testing/monitoring criteria for box beams, and finalize the design and details of production and testing and monitoring protocol.

CMHC Project Officer: Glynis Kossatz

CIDN: 1176 0200001,
1348 0200001

Division: Research Division, Housing Technology Incentives Program

STATUS: Ongoing Project

Grant Recipient: Art Wloski
4133 Northcliffe Avenue
Montreal, Quebec, H4X 3L2

AVAILABILITY: Publication not yet available

RE-USE: INTEGRATION OF USED BUILDING MATERIALS INTO NEW CONSTRUCTION.

The objective of this project is to promote the practice of re-use of building materials as a viable approach in the 3Rs of sound environmental practice for the construction industry, presently including waste management through recycling and reduction. Research will address 4 main concerns: economic, environmental, legislative/practical and perceptual -- presently barriers to viability in practice.

CMHC Project Officer: Darrel Smith

CIDN: 1842 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Mark Poddubiuk, Pearl Poddubiuk Architects
995 Girouard, Montreal, Quebec, H4A 3B9

AVAILABILITY: Publication not yet available

VIRTUAL SAMPLE ROOM WEB SITE OF GREEN BUILDING MATERIALS.

The objective of this project was to develop a bilingual web site which will serve as an on-line catalogue/sample room of building materials that provide low environmental impacts. It will serve anyone involved in the selection of the various building materials that go into residential buildings such as architects, builders, renovators, property managers, and homeowners. The site contains pictures of the products, the evaluation matrix, and the manufacturers information. This is a multi-partnered project including Public Works and Government Services Canada, Department of National Defense, Natural Resources Canada, Rural Municipality of Waterloo, and Human Resources Development Canada. The site is relatively small at present but it is expected to grow over the coming months following promotion of the site. It can be visited at www.sampleroom.buygreen.com.

CMHC Project Officer: Darrel Smith

CIDN: 1986 0200001

Division: Research Division

STATUS: Completed

AVAILABILITY: See above.

CONCRETE

DEVELOPMENT OF A NEW EDITION OF THE STANDARD FOR CONCRETE CONSTRUCTION FOR HOUSING AND SMALL BUILDINGS (CSA A438).

The purpose of this project is:

- ♦ to carry out a review of the literature pertaining to current failures of concrete in residential basements, specifically addressing the high incidence of foundation wall cracking and water penetration.
- ♦ to determine how the delivered ready-mix might be improved in crack-resistance and how on-site concreting practices might be remedied; and
- ♦ to bring standard A438 into line with the requirements of the 1994 edition of CSA 23.1 Standard Concrete Materials and Construction.

CMHC Project Officer: Don Fugler

CIDN: 1259 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available.

INVESTIGATION AND REPAIR STRATEGIES FOR CONCRETE CONSTRUCTION AND CATALOGUE OF INNOVATIVE CONCRETE ASSESSMENT AND REPAIR TECHNOLOGIES.

The purpose of this project is to create a survey questionnaire on concrete assessment, repair and monitoring strategies and report on existing protocols regarding concrete problems in multi-unit residential buildings.

CMHC Project Officer: Silvio Plescia

CIDN: 1890 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CONCRETE

STANDARDIZATION OF CONCRETE REPAIR PROTOCOLS.

This project will research current assessment, monitoring and repair strategies for concrete repair. Existing protocols commonly used in the field as well as existing protocol guidelines assembled by various agencies (eg. CSA) will be catalogued. This research will provide consultants, contractors and building owners with available protocols and concrete repair strategies.

CMHC Project Officer: Cate Soroczan

CIDN: 1890 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CONSUMER PROTECTION

ISSUES PAPER ON LIABILITY IN HOUSE CONSTRUCTION.

The Canadian Home Builders Association (CHBA) has expressed a concern that, in housing construction, it is becoming less clear who is liable for specific aspects relating to the house. They also are concerned that, as a result of cutbacks, municipalities are not carrying out inspections to the extent they once did and may be losing the capacity to properly enforce building regulations. This joint project, co-funded by CMHC and CHBA and managed by CHBA, will produce a paper discussing the issue of liability in housing construction across Canada and identify who is and is not liable. It will serve as the basis for discussion on these issues and for further study. The National Research Council (NRC) will also be a participating partner as the agency responsible for code development. An initial draft has been prepared and the project was extended to include provincial consultations at CHBA's request. A revised draft report is being reviewed.

CMHC Project Officer: Susan Fisher

CIDN: 1920 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CONTAMINATED LANDS

DEMONSTRATION OF SAFE HOUSING ON LIGHTLY CONTAMINATED LANDS.

CMHC research into contaminated lands shows that some types of soil contaminants could be rendered innocuous through building design and operation. One example is heavy metals deep within the soil. If these pollutants can be avoided through design, the cost of land remediation could be greatly reduced. The project will include contaminant monitoring and the investigation of the predictive capabilities of site specific risk assessments.

CMHC Project Officer: Don Fugler

CIDN: 1946 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

DESIGN OF DURABLE JOINTS BETWEEN THE WINDOWS AND THE ENVELOPE.

The objective of this project is to establish construction, parameter and calculation method concepts to improve the durability of joints between walls and windows.

CMHC Project Officer: Jacques Rousseau

CIDN: 1839 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient : Mario Petrone, Petrone Architecte
200-2545 Delorimier Street
Longueuil, Québec J4K 3P7

AVAILABILITY: Publication not yet available

INFLUENCE OF AIR INFILTRATION ON THE ENERGY EFFICIENCY OF RESIDENTIAL WINDOWS.

The objective of this project is to propose a new way of accounting for air infiltration in energy efficiency calculations for windows.

CMHC Project Officer: Ken Ruest

CIDN: 2002 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Michel Bernier
Department of Mechanical Engineering, École Polytechnique
P.O. Box 6079, Station CV
Montreal, Quebec H3C 3A7

AVAILABILITY: Publication not yet available

RETROFIT AND REMEDIAL WORK ON EXISTING SLIDING DOORS AND WINDOWS.

Aluminum sliding windows and doors help clad a significant proportion of the residential building stock in Canada. Since their appearance on the market in the 1950's, they gained in popularity and use due to their relative low cost, simple installation, and ease of maintenance. Deterioration of the original weatherstripping results in assemblies with poor air leakage performance and other incidental anomalies. Nationwide replacement of these windows and doors with more energy efficient models is a difficult and expensive undertaking.

It was the purpose of this study to analyse the alternatives which can be used to upgrade these windows rather than to completely replace them. By simply changing or replacing certain components, it was found that significant improvements could be achieved to the air leakage resistance of these units. Most of these upgrades, such as changing deteriorated weatherstripping gaskets with more efficient models, are relatively simple tasks which could be carried out by a building superintendent with some special training. The modified or upgraded doors and windows could thus obtain air leakage performance comparable to new windows on the market today. The costs associated with the implementation of such modifications are considerably less than those expected for complete replacement.

DOORS AND WINDOWS

Prepared by: Jozef Zorko, Desnoyers Mercure Inc. and Dominic Chiovitti, Patenaude Chiovitti Inc. CMHC Project Officer: Ken Ruest. Ottawa: Canada Mortgage and Housing Corporation, 1998. (External Research Program)

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

ENERGY CONSERVATION

BUILDING ENERGY ESTIMATION METHOD BASED ON FUZZY LOGIC AND NEURON NETWORKS.

The objective of this project is to establish a rapid building energy estimation method based on fuzzy logic and neuron networks.

CMHC Project Officer: Sandra Marshall

CIDN: 1841 0200001

Division: Research Division. External Research Program

STATUS: Ongoing Project

Grant Recipient: Stanislaw Kajl, Université du Québec,
INRS - Urbanisation in Montréal
3465 Durocher Street
Montreal, Quebec H2X 2C6

AVAILABILITY: Publication not yet available.

CMHC EMPTIED HEAT, AIR AND MOISTURE TRANSPORT MODELLING PROGRAM.

The purpose of this project is to provide engineering services to upgrade the CMHC EMPTIED Program from a DOS to Windows environment and to compile the necessary weather data to allow the program to evaluate the performance of wall systems in major cities of the U.S.

CMHC Project Officer: Duncan Hill

CIDN: 1107 0300003

Division: Research Division

STATUS: Ongoing Project

COMMUNITY ENERGY SYSTEMS (CES).

This project, in partnership with the CES group at Natural Resources Canada (CANMET), was conceived to investigate optimization of building/CES infrastructure investment. A research contract has been awarded to develop guidelines on the design of residential building HVAC systems that would render them retrofit ready for CES or other sources of low temperature energy with particular attention given to its use in hydronic heating systems.

CMHC Project Officer: Ken Ruest

CIDN: 1570 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available.

ENERGY EFFICIENCY CASE STUDIES OF MULTI-UNIT RESIDENTIAL BUILDINGS.

CMHC is in the process of documenting the application of energy efficiency measures in multi-unit residential buildings to be used as case studies. A trial case study of a housing co-operative in Ottawa is underway, to not only assess the strengths and weaknesses of the energy efficiency measures implemented, but also to identify what information can be disseminated to others in the building industry. Upon completion of the first case study, CMHC will be soliciting the housing industry for additional energy efficiency case studies. A compendium of case studies will be made available from CMHC. The case studies will also support the Energy Efficiency Opportunities Manual for Multi-Unit Residential Buildings that CMHC is in the process of developing.

CMHC Project Officer: Duncan Hill

CIDN: 1899 0200002-3

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

ENERGY EFFICIENCY OPPORTUNITIES MANUAL FOR MULTI-UNIT RESIDENTIAL BUILDINGS.

CMHC, in partnership with the Ontario Ministry of Municipal Affairs and Housing, is in the process of developing a manual that details energy efficiency measures for existing multi-unit residential buildings. The document will be based on one originally developed by the Ontario Ministry of Housing in the early 1980's. The new manual will offer proven, current energy efficiency measures for the building envelope, mechanical, electrical, and domestic hot water heating systems. A project steering committee consisting of members of the housing, utilities and government agencies has been formed to provide comment on the manual as it is developed. Publication of the manual is expected in 1999. The manual will be modularized and provided in such a format that will be easily updated over time.

CMHC Project Officer: Duncan Hill

CIDN: 1887 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

FIELD INVESTIGATION OF ENERGY IMPACT OF CORRIDOR AIR VENTILATION SYSTEMS.

A research project has been initiated to study the seasonal impact of the operation of corridor air ventilation systems in multi-unit residential buildings on heating season energy consumption. Traditionally, it was assumed that corridor air systems should be shut down during periods of low occupancy and/or occupant activity in order to reduce energy consumption. However, it is also suspected that shutting off a natural gas-fired corridor air system in an electrically heated building, may actually increase energy consumption. Both of the aforementioned assumptions are based on the theory that corridor air systems are capable of effective and efficient air delivery - which is now known to be incorrect. The research will attempt to determine the influence that the operation of corridor air systems within 4 buildings has on energy consumption. The systems will be cycled on and off over a sufficient period to allow for an analysis of trends in resultant energy consumption. This study will help to characterize the costs of operating corridor air systems and will also serve to identify energy efficiency strategies.

CMHC Project Officer: Duncan Hill

CIDN: 1934 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

FOUNDATION PAPER ON COMMUNITY ENERGY PLANNING.

Following the recent Kyoto summit on climate change, the federal government recently established fifteen "Issue/Sector Tables" to examine the costs and impacts of implementing Canada's greenhouse gas reduction targets. CMHC is a member of the "Municipalities Table" and co-chairs the subcommittee on "Community Energy Planning" (reporting to the Municipalities Table). CMHC recently funded the development of a Foundation Paper on Community Energy Planning to examine the potential energy savings and greenhouse gas emission reductions associated with integrated transportation and land-use planning, community energy systems (cogeneration, district heating, etc.), and other energy management options.

CMHC Project Officer: David D'Amour

CIDN: 2078 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INTERNATIONAL ENERGY AGENCY (IEA) : ENERGY RELATED ENVIRONMENTAL IMPACT OF BUILDINGS.

This three-year project, scheduled to end in 1999, is an IEA activity in which 14 countries are collaborating in the development of life-cycle energy modelling. Information will be compiled and published on the methodology and life-cycle environmental impact data. Examples will be developed of how methods may be applied to different building types and sources of expertise, with the potential for extending the influence of the task directly into academia. CMHC is acting as the Operating Agency for this project.

CMHC Project Officer: Jim Robar

CIDN: 1629 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

LABORATORY TESTING OF DENSE PACK CELLULOSE FOR ATTIC INSULATION.

Some insulators claim that dense packing of cellulose insulation into hard to reach cavities (e.g. flat roof attics) prevents air movement along with providing insulation. Hydro Québec looked at the technique for upgrading attic insulation of flat roof housing, largely in Montreal. CMHC and the Société d'habitation du Québec (SHQ) also contributed funds to this project. The field work is complete. CMHC is discussing with Hydro Québec ways of publishing the report or a condensation of its findings.

CMHC Project Officer: Don Fugler

CIDN: 1377 02010001,
1377 08010001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

OPTIMIZE: A METHOD FOR ESTIMATING THE LIFECYCLE ENERGY AND ENVIRONMENTAL IMPACT OF A HOUSE.

This computer program estimates the lifecycle energy requirements of a house as well as determining associated emissions. The program has been revised from a spreadsheet to a database to improve the instructions and user interface, and the computational speed. The application of the program is being expanded to include multiple, non part 9 national building code residential buildings by using Optimize to assess the lifecycle energy performance of the Conservation Co-op building in Ottawa.

CMHC Project Officer: Thomas Green

CIDN: 0865 0201002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

A PHYSICAL CONDITION AND IAQ CHECKLIST FOR NRCAN'S ENERGUIDE FOR HOUSES RATING SYSTEM.

Natural Resources Canada (NRCan) and a number of industry stakeholders have developed a Canadian home energy efficiency rating system for existing homes. The rating is based on a visual evaluation of the house condition, a blower door test and energy data collection which is analyzed using a computerized tool to identify the energy utilization of a new and/or existing home. The house is then plotted on an energy utilization scale as it compares with performance criteria and assigned a numerical rating. The overall goal of this system is to reduce CO2 emissions on the environment. This CMHC project involved the production of an evaluation "checklist" that is used to assess the physical condition and indoor environment of a house. This checklist is complete and will be incorporated as part of NRCan's EnerGuide for Houses Program.

CMHC Project Officer: Darrel Smith

CIDN: 1922 0200001

Division: Research Division

STATUS: Completed; see above

RE-INSULATING WITHOUT ANY CONDENSATION PROBLEMS - EFFECT OF ADDING INSULATION ON THE DISPERSAL OF EXFILTRATING AIR.

The objectives of this project are: 1. To test a method of characterizing air exfiltration, experimentally and analytically. 2. To determine the impact of two insulation strategies - from inside and from outside - on the dispersal of exfiltrating air through various types of joints.

CMHC Project Officer: Sandra Marshall

CIDN: 1853 200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Dominique Derome, Concordia University
1455 de Maisonneuve Blvd. West
Montreal, Quebec H3G 1M8

AVAILABILITY: Publication not yet available

RENTAL STOCK ENVELOPE SURVEY.

The STAR Database, used for modelling Canadian housing performance, requires data from a representative number of rental houses. This project will look at rental housing stock to see how it differs from owner-occupied stock and will examine how rental stock could be suitably sampled for inclusion in the STAR Database.

CMHC Project Officer: Don Fugler

CIDN: 1766 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SUPPORT FOR THE ENERNET STUDENT TRAINING NETWORK.

CMHC is contributing to a project by SIRICON using the Internet to educate students in 20 Québec high schools on the principles of building science and house energy auditing. The WEB site is now complete and schools are participating. The Spring 1998 interim report showed that there were few schools who could participate over the 1997/98 school year. SIRICON intends to develop a larger sample of schools.

CMHC Project Officer: Don Fugler

CIDN: 1822 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

UPDATING THE AIRTIGHTNESS TESTING STANDARD.

The airtightness testing standard, Canadian General Standards Board (CGSB) 149.10, was published in 1986 and requires updating and simplification. CMHC has engaged CGSB and a contractor to undertake this work in 1998/99. A draft standard has been submitted to CMHC for review and detailed appendices are being rewritten prior to sending the standard out for ballot.

CMHC Project Officer: Don Fugler

CIDN: 1971 0200001,
1971 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CLEANING UP YOUR HOUSE AFTER A FIRE.

This booklet, one of a series, will offer practical advice on what should be done to avoid health problems when moisture problems or calamities occur. After a fire there can be ongoing smoke and mold problems that can seriously affect the health of occupants. A point-form reference card, that is intended to be hung by the furnace, is also being written and will be available from fire departments.

CMHC Project Officer: Ken Ruest

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

THE COSTS AND BENEFITS TO MUNICIPALITIES OF MANDATORY RESIDENTIAL FIRE SPRINKLERS.

This multi-year study is examining the financial impact on municipalities if all new housing was required to have fire sprinklers. A complementary study is assessing the change in life risk from fire. The work is being undertaken by Arencon Inc., Clayton Research Associates, and the National Fire Laboratories/NRC and is funded by CMHC, the Ontario Ministry of Municipal Affairs & Housing and the Office of the Ontario Fire Marshall.

The study uses a case study approach to assess the changes in costs and benefits that could occur if municipalities were to adopt mandatory sprinkler requirements for all new residential construction. There are six case study sites: Barrie and Burlington, Ontario; Pitt Meadows, B.C.; Edmonton, Alberta; Kawacatoose First Nation, Saskatchewan; and Gatineau, Québec. The data collection, interviews with municipal and fire officials, economic and risk analysis are completed. The results were presented for review at a stakeholder forum and the final draft has been circulated to stakeholders for a final review. The report is expected to be available by the end of 1998.

CMHC Project Officer: Mark Holzman

CIDN: 1235 0300002

Division: Research Division

STATUS: Completed

INVESTIGATION OF SMOKE CONTROL IN HIGH-RISES BY POSITIVE PRESSURE VENTILATION.

A research project has been initiated to study the use of positive pressure ventilation (PPV) systems to contain and expel smoke from high-rise buildings during a fire emergency. PPV systems have been used in the U.S. in low-rise buildings. The system consists of a portable, high velocity fan which is used by the fire department to clear smoke from buildings in order to facilitate access to the fire and to aid in occupant evacuation. Preliminary studies have been conducted in multi-unit residential buildings but not in cold climates where stack effect may continue to dominate smoke movement. The research program is the result of a joint venture between CMHC, the City of Ottawa Fire Department and the Fire Laboratory of the Institute for Research in Construction of NRC. The ability of PPV to contain and clear smoke from exitways in high-rise buildings will be evaluated at the Fire Laboratory's full scale test building under both summer and winter conditions. If successful, PPV may offer Fire Departments an effective, low cost life and property saving tool.

CMHC Project Officer: Duncan Hill

CIDN: 1983 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

FIRES & FIRE PREVENTION

IT COULD NEVER HAPPEN TO ME, HIGH RISE FIRE SAFETY KIT.

This high rise fire safety kit consists of a videotape training program for use within the fire service; a videotape targeted to the general public; and public service announcements for radio and television promotion. Appropriate safety messages include proper evacuation procedures, the importance of insurance coverage, and residential prevention measures, such as smoke alarms, fire extinguishers and a family escape plan. This information is applicable to all people who live in high-rise buildings, but also to persons who visit or stay in high rise buildings for short periods of time, such as in hotels. CMHC was a partner in the development of these materials as part of a national high-rise fire safety education campaign.

CMHC Project Officer: Thomas Green

CIDN: 1610 0300

Division: Research Division

STATUS: Completed Project

AVAILABILITY: Carleton Productions International
P.O. Box 5069, Merivale Depot
1500 Merivale Road, 5th Floor
Ottawa, Ontario
K2C 3H3
Phone: (613) 224-9666

LEARN NOT TO BURN CURRICULUM FOR ABORIGINAL COMMUNITIES.

The purpose of this project is to modify the Learn Not to Burn curriculum, successfully developed and used by the U.S. National Fire Protection Agency (NFPA), for usage in Canadian First Nations communities. The Aboriginal curriculum has been developed by the Assembly of First Nations, with the assistance of the NFPA, the Aboriginal Firefighters' Association and CMHC, pilot tested in several First Nations classrooms, and will be available for K-2 modules in 1999.

CMHC Project Officer: Alain Croteau

CIDN: 1719 0300001

Division: Assisted Housing Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

FLOODS

THE JULY 1996 DISASTER IN THE SAGUENAY: THE EXPERIENCE OF REDEFINING A HABITAT.

The objective of this project is to understand and analyze the adaptation and integration mechanisms set up by families in rebuilding their homes following a natural disaster.

CMHC Project Officer: Marcel Boily, Chicoutimi Branch Office

CIDN: 1833 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Danielle Maltais, Université du Québec à Chicoutimi
555 de l'Université Blvd.
Chicoutimi, Quebec G7H 2B1

AVAILABILITY: Publication not yet available

CARPET STREAKING . ABOUT YOUR HOUSE; CE14

Carpet streaking is permanent, dark staining near baseboards, air registers, under doorways, and in other areas where moving air may filter through rug fibres. What causes it, how to avoid it and what to do if you have it, are all covered in this handy fact sheet.

May be of interest to homeowners, builders and renovators, carpet retailers, carpet cleaners, property managers, building inspectors, etc.

Ottawa: Canada Mortgage and Housing Corporation, 1999.

STATUS: Completed Factsheet, 2-pages (8-½ x 11), black & white.

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre: *Taches en traînée sur les moquettes.*

EVALUATION OF RESIDENTIAL, IN-DUCT AIR FILTERS.

There are many residential air filters that have appeared in the last several years, providing an abundance of choice for consumers. Unfortunately, consumers have little objective information on the relative performance of these filters. This project is testing the performance of different filters, from disposable fiberglass to electrostatic precipitators, in houses. The contractor has looked at how air filtration affects the levels of particulates (dust) in housing, and at the production of ozone by electrostatic precipitators. Testing is complete in the six sample houses and data analysis is in progress. Twenty houses with existing electrostatic precipitators have been sampled for indoor ozone concentrations in late Fall of 1998. Preliminary analysis shows that good filters do remove particulates at rates that are close to their rated performance. However, the use of a good filter will not necessarily render house air pristine due to large particulate sources both inside and outside the house.

CMHC Project Officer: Don Fugler

CIDN: 1620 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

FIELD SURVEY OF HEAT RECOVERY VENTILATION SYSTEMS.

This research assessed the ability of occupants to operate and maintain HRV systems and the effects of maintenance on system performance. It also evaluated the ventilation effectiveness of common HRV installation methods and several other innovative ventilation systems for new and retrofit installations. The project involved the inspection of 60 houses with heat recovery ventilation systems, a survey of the occupants to determine their understanding and usage of their ventilation systems, telephone surveys of a further 15 households and intensive performance testing of 20 conventional and four experimental ventilation systems.

The research concluded that common conventional approaches to HRV installation were capable of ventilating houses in an effective manner. The majority of the HRV systems inspected were used and the occupants believed that the use of the HRV system was beneficial. While most occupants understood the intent of the systems, few were fully aware of all of the considerations involved in the operation and maintenance of these relatively complex systems which was reflected in the condition of the HRV installations. The study found that considerable improvements are possible in installation practice, system performance, occupant understanding and interaction with their ventilation systems.

CMHC Project Officer: Duncan Hill

CIDN: 1376 0200001

Division: Research Division

STATUS: Completed

FIELD TESTING TO CHARACTERIZE SUITE VENTILATION IN RECENTLY CONSTRUCTED MID- AND HIGH-RISE RESIDENTIAL BUILDINGS

This report provides a snapshot of suite ventilation in recently constructed mid- and high-rise residential buildings in Canada. The purpose of this study was to clarify if current code requirements and HVAC design practices are ensuring that suites are being properly ventilated under typical operating conditions.

This study examined one suite in each of ten buildings that are located in major cities across Canada. Field performance tests showed suite ventilation to be highly influenced by weather, location within the building, and treatment of both interior and corridor access doors. As a result, ventilation within a suite at any given time is very difficult to predict. Furthermore, for all intents and purposes, ventilation in these buildings is uncontrolled.

The greatest concern raised by this study is the amount of transfer air that is part of ventilation air in the suites tested. Large amounts of transfer air from other occupied suites in the building may compromise the quality of ventilation air entering suites. Although not part of this study, large amounts of transfer air during a fire emergency may also increase the danger to occupants as fire and smoke spread within the building.

To ensure suite ventilation is both controlled and adequate under normal operating conditions, the building industry will need to develop and follow a strict set of ventilation design practices. New practices should not compromise safety or create excess energy use.

Prepared by Sheltair Scientific Ltd. Prepared for Innovation Centre for High-rise and Multiples, Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Duncan Hill. Ottawa: CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

FIELD TESTS OF VENTILATION SYSTEMS DESIGNED TO MEET 1995 NBC.

This study concerns new houses designed and built to provincial or municipal codes that require the 1995 National Building Code. Ventilation requirements in recent Canadian building codes have become more complex and problematic to builders. The ventilation design needs to balance fresh air and exhausting air, and to consider house depressurization factors. The research team is performing air testing on thirty new houses to verify their compliance with code required ventilation. Houses will be tested in the western provinces, the North, and the Maritimes.

CMHC Project Officer: Don Fugler

CIDN: 2062 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HVAC SYSTEMS OF MID AND HIGH-RISE RESIDENTIAL BUILDINGS.

An evaluation of the mechanical systems of 25 mid and high-rise residential buildings has been performed in order to determine the changes in design and installation practices required by the 1995 National Building and Energy Codes. Additionally, the performance of the mechanical ventilation systems has been assessed in 10 buildings in terms of design criteria, design procedures, system strategies and installed performance levels. The research found that air tends to move through apartment buildings more by accident than design. This is due to a lack of information on the environmental conditions and building physical characteristics that govern natural and mechanical air flow. Consequently, it is difficult to ensure that there is adequate fresh air delivery to any point in a building, given conventional mechanical air system design. This information will be used to produce advisory documents showing how to meet codes and improve system performance. Final report is in production.

CMHC Project Officer: Duncan Hill

CIDN: 1424 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

IDENTIFYING AND REMOVING POLLUTANTS FROM HEAT RECOVERY VENTILATORS.

The objective of this project is to determine whether dedicated ventilation systems harbour unhealthy levels of dust, mould and/or fungi; whether existing duct cleaning methods are successful at lowering those levels; and to develop recommendations and guidelines for builders and homeowners for the maintenance of dedicated residential systems.

CMHC Project Officer: Don Fugler

CIDN: 1652 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Terry Watters
Rural Route #3, Comp 308
Wolfville, Nova Scotia, B0P 1X0

AVAILABILITY: Publication not yet available

LOW TEMPERATURE HYDRONIC HEATING SYSTEMS.

The objective of this project is to investigate low temperature hydronic systems (LTHS) as an energy option and identify additional information and action needed to assess, document, and appropriately advance LTHS.

CMHC Project Officer: Peter Russell

CIDN: 1570 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

MARKET VIABILITY OF INTEGRATED APPLIANCES IN CANADIAN MULTI-FAMILY MARKETS.

The purpose of this project is to provide financial support to establish a research consortium made up of members of the housing research community, utilities, manufacturers and suppliers of heating, ventilating and air-conditioning equipment and other relevant public and private agencies to research, analyse and report on the technical and market viability of integrated natural gas-fired appliances for multi-unit residential buildings.

CMHC Project Officer: Duncan Hill

CIDN: 2045 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

MONITORING A DUEL HEATING SYSTEM INSTALLATION.

This research will monitor and assess the performance of a dual fuel heating system in an 89 suite apartment building.

CMHC Project Officer: Duncan Hill

CIDN: 1899 0200004

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PART-LOAD AND FROSTING CONTROL FOR ROTARY ENERGY WHEELS USED IN RESIDENTIAL BUILDINGS.

The objective of this research is to determine the performance of rotary energy wheels, also called enthalpy wheels, for ventilation air exchange in residential buildings while subjected to a wide range of operating conditions.

CMHC Project Officer: Duncan Hill

CIDN: 2007 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Robert W. Besant
Dept. of Mechanical Engineering, University of Saskatchewan
57 Campus Drive
Saskatoon, Saskatchewan S7N 5A9

AVAILABILITY: Publication not yet available

PERFORMANCE QUANTIFICATION ON SINGLE WELL HEAT PUMP.

The objective of this project is to quantify the performance of an existing open loop ground source heat pump system which uses a single domestic water well for both its supply and discharge requirements, and to demonstrate that a single well can be used as both the supply and discharge source for open loop ground water heat pump systems.

CMHC Project Officer: Chris Ives

CIDN: 1267 0200001

Division: Research Division, Housing Technology Incentives Program

STATUS: Ongoing Project

Grant Recipient: Bob Vasily and Associates
RR #1
Seeley's Bay, Ontario, K0H 2N0

AVAILABILITY: Publication not yet available

RESIDENTIAL MECHANICAL VENTILATION SEMINARS.

This was a partnership project between CMHC, HRAI and NRC. NRC was responsible for the development of the material as well as the promotion and delivery of the seminars. HRAI was the delivery agent. The objective was to develop and deliver a one day seminar on residential mechanical ventilation and the 1995 National Building Code requirements. It covered the need for ventilation in relation to indoor air quality and the benefits that it provides to the occupants. Common, affordable ventilation system options which satisfy the code requirements were discussed in detail. Options included systems that are coupled to ducted heating systems as well as those which were not. It was targeted to builders and home inspectors. The seminar was suitable for delivery in all provinces and territories which had adopted the 1995 NBC. CMHC is considering a partnership to continue offering these seminars throughout Canada in 1999.

CMHC Project Officer: Darrel Smith

CIDN: 1972 0200001

Division: Research Division

STATUS: Completed

RETROFITTING VENTILATION.

This project is to examine how effectively ventilation can be retrofitted to existing houses, either as a stand-alone project or as part of a larger renovation. The research team will test the effectiveness of retrofitted ventilation systems in older homes and their effects on indoor air quality. It will also describe practical methods for installing ventilation equipment and ducting in older homes.

CMHC Project Officer: Don Fugler

CIDN: 2063 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

TESTING OF DOMESTIC OIL TANKS.

This report describes research to find a method to test domestic fuel oil tanks for potential leaks and suitability for future service. After an introductory statement the first section offers a description of the construction of the type of tank under study, an explanation of the failure mode addressed as well as some assumptions concerning the tests investigated. The next section explores inspection techniques currently practised by various organisations. The final section examines a number of potential test methods.

*Prepared by William Moody, Moody Engineering Consultants. CMHC Project Officer: Darrel Smith.
Ottawa: Canada Mortgage and Housing Corporation, 1998. (External Research Program)*

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

TESTING OF RESIDENTIAL HEATING AND VENTILATION SYSTEMS FOR THE NORTHERN ENVIRONMENT

Heating and ventilation have always been critical concerns of homeowners and the housing industry living and conducting business in the north.

With the rise in fuel prices in the mid 1970's there has been an ever increasing emphasis on energy efficiency. Along with the benefits of building dwellings in an energy efficient manner, come corresponding problems - the chief of those problems concerns maintaining a healthful level of indoor air quality.

Several heating and ventilation schemes have been developed to provide adequate fresh air to a dwelling, but none specifically for the Yukon environment. Equipment testing is generally not done below -20°C, which is sufficient for the larger Canadian market, but not for trouble free operation in the north with its extended periods of -40°C or colder temperatures.

As well, the lifestyle of Northerners is different from those in more southerly climes. Many Yukoners do not venture out of the home during cold snaps, and tend to sit close to the heat source, with all sources of cold draughts sealed tight against the cold - often including designated sources of fresh air to the dwelling.

The 1995 National Building Code created a further complication for homeowners and builders alike. The air change rates, which are mandatory through the 1995 code - even during times of severe cold - have been questioned by both builders/installers and knowledgeable homeowners as being excessive.

This report is the culmination of Phase I, of a four phase project, which will attempt to provide answers to many of those questions by installing several different configurations of heating/ventilating systems, and monitoring them. This will provide an opportunity, as well, to validate or disprove the requirements of the code as it applies in a northern environment and possibly make recommendations to the NBC Standing Committee on Heating, Ventilating and Air Conditioning.

This report contains the results of Phase I of the project described above. The phases of the project are:

- Phase I - Scope of the Problem
- Phase II - Background Research and Study Design
- Phase III - Field Research
- Phase IV - Evaluation and Reporting

Phase I consisted of the administering of two questionnaires, one to homeowners, and another to industry stakeholders. Their replies provide a true perspective of what problems and difficulties are being encountered with heating and ventilation systems and provide the project with an understanding of where attention should be focused. Various complaints are heard from homeowners and housing professionals in the north regarding heating and ventilation systems. These complaints cover a range of concerns and problems which the questionnaire results would verify or dispel.

A joint venture research and development project undertaken by Canadian Home Builders Association - Yukon and Yukon Housing Corporation. Funding provided by Canada Mortgage and Housing Corporation. CMHC Project Manager: Darrel R. Smith. Ottawa: CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

ADVISORY DOCUMENT ON MECHANICAL AND ELECTRICAL SYSTEMS IN MULTI-UNIT RESIDENTIAL BUILDINGS.

The technical report on the design of energy conserving equipment and systems providing plumbing, heating, ventilation and air conditioning, lighting and power in multiple-unit buildings has been reviewed by practitioners. The system design and installation practices noted in the report are being modified to reflect their comments. An advisory document to recommend "good engineering practice" for designers, owners and consultants should be available in 1999.

CMHC Project Officer: Duncan Hill

CIDN: 1774 0300004, 5, 7

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BC MOISTURE PROBLEMS - COMPUTER SIMULATIONS.

This research will study, through the use of computer simulations using the WALLDRY computer program, the drying potential of various wall configurations and is intended to provide data to bolster recommendations to be incorporated in the "Best Practice Guide for the Coastal Area of British Columbia". The results of the work will also be used to guide in the development of the Envelope Drying Rate Analysis Project. As the cost of doing all the tests proposed is prohibitive, it was recommended that computer simulation WALLDRY be used to determine which walls might be more promising to test than others, potentially leading to a reduction in the cost of the test program.

CMHC Project Officer: Jacques Rousseau

CIDN: 1816 0300004

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BC MOISTURE PROBLEMS - ENVELOPE DRYING RATES EXPERIMENT.

Findings from the 'Survey of Building Envelope Failures in the Coastal Climate of British Columbia' revealed that the construction of walls with face seal or concealed barrier systems does not promote rapid drying of wall assemblies once the moisture has saturated the moisture barrier and passed into the sheathing. The solution to promote drying of the wall assembly has been to introduce an air cavity behind the claddings. The objective of this project is to identify, through laboratory work, a range of cavity and vent configurations which will provide wall drying capability characteristics necessary to deal with the coastal British Columbia climate. In addition to the vents, the effect of insulation, vapour barrier, type of building paper and type of cladding will be investigated.

CMHC Project Officer: Sylvio Plescia & Mark Salerno

CIDN: 1816 0300009

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BC MOISTURE PROBLEMS - HYGROTHERMAL PERFORMANCE OF STUCCO.

The project objectives are to develop fundamental and applied understanding of the hygrothermal performance of stucco based wall systems for Vancouver, B.C. weather conditions. The properties will be investigated through laboratory evaluation. The long term hygrothermal behaviour of the building envelope components will be simulated using the LATENITE computer program. The result of the work will guide the "Envelope Drying Rate Analysis" study. The work is being collaboratively funded with the NRC/Institute for Research in Construction and is part of the recently launched Consortium on Moisture Control Strategies of Wall Systems.

CMHC Project Officer: Jacques Rousseau & Mark Salerno

CIDN: 1816 0300007

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

B.C. MOISTURE PROBLEMS - QUALITY ASSURANCE PROTOCOL.

The objective of this study is to produce a protocol which will form the baseline quality management system for the exterior envelope of 3 and 4 storey wood frame construction in British Columbia. The protocol deals with the conclusion and recommendations identified in the "Survey of Building Envelope Failure in the Coastal Climate of British Columbia". The protocol will also tie into the "Best Practice Guide for Wood Frame Construction in the Coastal Climate of British Columbia". The draft protocol has been reviewed and will require a 'test drive' in a real project in order to refine it. Developers have been approached and they are willing to collaborate to this end.

CMHC Project Officer: Jacques Rousseau and Mark Salerno

CIDN: 1816 0300006

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BC MOISTURE PROBLEMS - SMALL SCALE TESTING AND DEVELOPMENT PROTOCOL.

This work results from the conclusions and recommendations of the "Survey of Building Failures in the Coastal Climate of British Columbia". The intent of this initial testing project is to give the industry some sense of what will or will not work and examine the sensitivity of the various systems to specific variables. The testing will provide a relative comparison under a specific set of environmental conditions. Although the work will not provide a definitive solution, it will serve to provide guidance regarding the use of some proposed new assemblies. The work will also develop protocol for the "Envelope Drying Rate Analysis" which is currently planned. The work is being funded in collaboration with the NRC/Institute for Research in Construction, the City of Vancouver, Van Maren Limited, Centreville Limited and Aquastap Limited.

CMHC Project Officer: Jacques Rousseau and Mark Salerno

CIDN: 1816 0300005

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BEST PRACTICE GUIDE: BUILDING ENVELOPE DESIGN FOR WOOD FRAME WALL ASSEMBLIES.

This "best practice" guide will present various exterior wall assemblies with wood frame construction. The document will contain construction details, specifications, sequence of construction and inspection/commissioning information. The document will be available in paper copy and on CD-ROM.

CMHC Project Officer: Sandra Marshall

CIDN: 1930 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BEST PRACTICE GUIDE - FIRE AND SOUND ASSEMBLIES FOR MULTI-FAMILY BUILDINGS.

This document, targeted at designers of multi-family buildings, will provide the latest information on CMHC research into fire and sound partitions, floors, flanking, plumbing noise, etc. The document is being produced in collaboration with the NRC/IRC.

CMHC Project Officer: Ken Ruest

CIDN: 1804 0300003

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CASE STUDIES FOR INNOVATIVE TECHNOLOGY AND SOLUTIONS IN SUCCESSFUL MULTI-FAMILY HOUSING.

Successful innovative Canadian multi-family residential buildings are being identified and documented for future monitoring. Areas such as durable building envelope, energy savings, life-cycle costs and environmentally responsive solutions will be evaluated. One multi-family residential building, the Conservation Co-operative, was selected for evaluation and was presented at the Green Building Challenge in Vancouver in the Fall of 1998. Posters of several Canadian residential projects were prepared for the October GBC conference. The selected systems will be the subject of illustrated 2-page case stories.

CMHC Project Officer: Sandra Marshall

CIDN: 1817 0300001, 2

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CASE STUDY OF THE RENOVATION OF AN APARTMENT BUILDING WITH SOLID MASONRY WALLS.

A 90 year old commercial building with solid masonry walls has been gutted and renovated into a residential building for low income single persons. The renovation involved the addition of thermal insulation to the building envelope, the application of stucco to the exterior of three of the four sides of the building, restoration to the front masonry facade, installation of a balanced mechanical ventilation system and a combination hydronic baseboard/radiant floor heating system. The building envelope is being monitored to provide an indication of its potential long-term performance. Energy and water use and indoor air quality will also be monitored in the renovated building to assess the strengths and weaknesses of the renovation strategy. A case study will be produced to document the work undertaken and the results of the performance monitoring.

CMHC Project Officer: Duncan Hill

CIDN: 1730 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

COMPARATIVE ANALYSIS OF RESIDENTIAL CONSTRUCTION IN SEATTLE, WA AND VANCOUVER, B.C.

This research will focus on the comparative differences (if any) in construction and determine if a similar cause of building envelope failure is occurring in the typical low rise multi-unit (3 to 4 storey) wood framed residential development built in the Seattle area.

CMHC Project Officer: Jacques Rousseau

CIDN: 1569 0300003

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

ENVIRONMENTAL IMPACT ASSESSMENT TOOLS FOR MULTI-UNIT HOUSING.

This project will assess 6 different environmental assessment tools to determine their applicability to multi unit residential buildings. The best features and limitations of each tool will be identified and transmitted to the authors of each tool. Four innovative buildings will then be assessed by one of the tools. This work was presented to the Green Building Challenge '98 (GBC) Committee as part of CMHC's contribution to the development of the residential component of the Green Building Challenge overall evaluation criteria for buildings of all types. The GBC is an international conference on the performance assessment of buildings held in Vancouver October 1998. Further work will be done in 1999 to develop a comprehensive environmental impact assessment tool for highrise buildings, including the identification of related benchmarks, and the associated costs and savings from reducing environmental damage.

CMHC Project Officer: Cate Soroczan

CIDN: 1872 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

ESTABLISHING THE FEASIBILITY AND FRAMEWORK FOR A MULTI-FAMILY HOUSING DATABASE.

CMHC performed a project to evaluate the feasibility of establishing a nationally representative multi-family housing database. Anticipated uses for such a database include, studies of the impact of energy retrofits on the energy consumed and pollutants emitted by multi-family housing. With an appropriate level of data, repair and replacement trends impacting on condition and resource requirements for this form of housing, could be identified. The study concluded that there was insufficient data available to define the population of multis in Canada in terms of age, size, construction and location. Additionally, the quantity and quality of existing data on actual buildings is insufficient to populate a truly representative database. The study recommended a number of paths that could be taken to establish a multi-unit residential building database both for the near- and long-term.

CMHC Project Officer: Duncan Hill

CIDN: 1805 0800001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

EXPORTING CMHC'S TECHNICAL SEMINAR SERIES.

Over the past fifteen years, CMHC has undertaken research work into the development of technologies for highrise buildings. The work could be marketable in the US and other countries where they are being faced with similar concerns regarding energy efficiency, airtightness, noise control and rain penetration control of the building envelope. CMHC's research activities into the building sciences were undertaken by Canadian consulting firms who have gained considerable knowledge that could also be marketed in other countries. A pilot series of seminars is being developed to be conducted in the USA in partnership with the Building Environmental Thermal Envelope Council with funding from the Dept. of Energy.

CMHC Project Officer: Jacques Rousseau

CIDN: 1928 0200

Division: Research Division

STATUS: Planned

AVAILABILITY: Publication not yet available

GOVERNOR'S ROAD AND SPENCER CREEK VILLAGE PROJECT, DUNDAS, ONTARIO.

The purpose of this project was to carry out the CMHC Healthy Housing and IDEAS Challenge objectives on the Governor's Road and Spencer Creek Village project in Dundas, Ontario.

CMHC Project Officer: Sandra Marshall

CIDN: 0840 0309007

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

GUIDELINES FOR THE RETROFIT OF UNINSULATED MASONRY WALLS.

In cooperation with NRC's Institute for Research in Construction, a project has been initiated to assess common forms of solid masonry walls in commercial and residential buildings and current energy retrofit strategies. Investigations of previously retrofitted walls are being performed to determine the impact on the durability of the building envelope.

CMHC Project Officer: Duncan Hill

CIDN: 1730 0300003

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

IDEAS HIGH-RISE CHALLENGE.

The IDEAS Challenge is intended to demonstrate the benefits of innovative design and technology in the operation of high-rise residential buildings. The Challenge focuses on five aspects of building design: envelope durability, energy efficiency, indoor air quality, environmental conservation and accessibility. One project in Montreal is built and monitoring is being carried out. Acoustic details have been tested. Two booklets are available, one that describes the IDEAS Challenge and the features of the five finalist projects and another which is a "Better Building" guide to innovation in the design and construction of high-rise residential buildings. The design process of a building in Dundas, Ontario which is exploring the adaptation of the IDEAS Challenge goals and details of CMHC's Best Practice Guide, is being documented. Projects in Victoria, Vancouver and Edmonton are also ongoing.

CMHC Project Officer: Sandra Marshall

CIDN: 0840 0300

Division: Research Division

STATUS: Ongoing Project

MODELLING OF AIR/MOISTURE MOVEMENT AND DURABILITY PERFORMANCE OF RESIDENTIAL AND COMMERCIAL BUILDINGS.

The purpose of this project is to develop knowledge to assess the impact of various wall designs, ventilation and indoor environment conditions on the durability and energy efficiency of new and retrofitted high-rise residential and commercial building systems.

CMHC Project Officer: Duncan Hill

CIDN: 1934 0200003

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

MONITORING INNOVATIVE MECHANICAL AND ELECTRICAL SYSTEMS.

The innovative mechanical and electrical energy consuming and producing systems in high-rise housing at a recently completed housing project in Peel, west of Toronto, are being monitored. A gas-fired cogeneration system was installed that provides electricity and thermal heat to the building. The building's owners are concerned that the system is not performing in an economically viable manner. An extensive monitoring and performance assessment is underway to evaluate system performance. The cost of energy provided to the building by the cogeneration system in terms of fuel consumption, maintenance expenditures, avoided utility invoicing and other considerations will be assessed. The performance and cost of the cogeneration system will be compared to other alternative but more conventional options.

CMHC Project Officer: Duncan Hill

CIDN: 1260 0800001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

MONITORING THE RETROFIT OF A RESIDENTIAL HIGH-RISE BUILDING ENVELOPE.

A case study of a 20 year old high-rise building in Toronto has been undertaken to document and monitor the performance of the retrofitted walls. In November 1997, an Exterior Insulating Finish System (EIFS) was installed over the precast block walls as part of an overall building renewal project. Instrumentation to monitor heat, air and moisture regimes within the wall sections was installed which is currently being monitored for one year to assess the performance of the retrofit strategy. Preliminary results indicate that the walls are performing in a satisfactory manner but an assessment of the full year's monitoring will be necessary.

CMHC Project Officer: Duncan Hill

CIDN: 1602 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

OPERATING AND MAINTENANCE BOOKS FOR MECHANICAL AND ELECTRICAL SYSTEMS IN MULTI-UNIT BUILDINGS.

Two publications, currently in 'draft' stage, on improving the operating performance of modern residential building systems have been developed. The first document, for owners and managers, links good operating practices with desirable investment strategies. The second, for building operating and maintenance staff, updates information on mechanical and electrical systems and incorporates preventative maintenance checklists for multi-unit residential buildings.

CMHC Project Officer: Jacques Rousseau

CIDN: 1774 0300004

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PERFORMANCE MONITORING: BRICK VENEER/STEEL STUD (BV/SS) WALL SYSTEM: PHASE 4.

Phase 4 of this study involves a fourth year (1997/98) of in-situ performance monitoring of a BV/SS wall system, with respect to air and moisture movements after the top vents in the brick veneer wall have been opened. The performance of a wall is being monitored using temperature, moisture and air pressure sensors connected to an automatic data logging system. Preliminary results indicate that the vent holes did not contribute to drying the wall but increased the moisture loading of the brick veneer. Even though the BV/SS wall system is typical of current practices and workmanship was satisfactory, the results of the study demonstrate that performance problems exist that may lead to significant distress over the long term. The more serious performance problems identified in this study are due to design weakness demonstrating the need to improve design and construction standards. Phase 1 & 2 reports are available from CMHC. The results of the Phase 3 research demonstrated no significant difference from Phase 1 and 2 and the Phase 4 draft report has been received.

CMHC Project Officer: Jacques Rousseau

CIDN: 0787 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RAIN CONTROL BEST PRACTICE GUIDE.

This document, currently in the 'draft' stage, provides the latest information on controlling the penetration of rain into walls. It is based on CMHC's research and other information regarding rain penetration control. The work is being funded in collaboration with the American Architectural Manufacturers Association.

CMHC Project Officer: Jacques Rousseau

CIDN: 1258 0300004

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RAINSCREEN 2.1 COMPUTER PROGRAM.

The RAINSCREEN program was developed to assist in the design of rainscreen pressure equalized wall assemblies. This project is aimed at producing a new version of the RAINSCREEN computer program, including a tutorial program and a manual that will be much more user-friendly. The work involves adapting the existing program to Windows and Mac environments and validating the program to laboratory test results to increase user confidence in the program. The BETA IBM version of Rainscreen 2.1 (English only) is available through e-mail (jroussea@cmhc-schl.gc.ca). The program is being updated to offer a better interface to determine the effects of the air barrier and cladding flexibility.

CMHC Project Officer: Jacques Rousseau

CIDN: 1258 0300005

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

REMEDIATION OF B.C. MOISTURE TROUBLED BUILDINGS.

This project will research and prepare diagnostics and recommended procedures for the cost effective remediation of leaking condominiums in the lower mainland of B.C. The project will develop a standard method of damage assessment, to develop a solutions tool which considers technical, code compliance, financial implications and practicality of repair. A document will also be prepared for property managers and for strata councils - on maintenance and repair issues. The project duration is expected to be one year.

CMHC Project Officer: Ken Ruest & Mark Salerno

CIDN: 2061 0200

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

REPAIR AND RETROFIT CASE STUDIES FOR MULTI-UNIT RESIDENTIAL BUILDINGS

CMHC is documenting repair and retrofit activities in multi-unit residential buildings. The first 30 case studies will document building characteristics, the type of problems that prompted the repairs and retrofits, costs, benefits, etc. A wide range of case studies will be included to reflect regional repair and retrofit priorities. The studies will be useful for other members of the multi-unit residential building industry to refer to when considering similar projects. An information template that can be used as a guideline for the type of information that should be extracted from a repair or retrofit project in a multi-unit residential building has been developed. CMHC is currently soliciting the building industry for case studies and will retain consultants to provide the necessary documentation. A compendium of case studies will be assembled and made available

Project Officer: Duncan Hill

CIDN: 1782 0300001-7

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available.

STUDY TO EVALUATE CAUSES OF MOISTURE PROBLEMS IN ALBERTA HOUSING.

In partnership with the Alberta Housing Technical Committee, this project is to investigate the alleged problem of moisture ingress into low-rise wood frame housing in Alberta. At the present time, industry opinion is divided on the source of moisture critical to the cause of reported water leakage incidents and this study will provide some clarity to the issue.

Project Officer: Ken Ruest and Halayna Tataryn

CIDN: 2066 0200001

Division: Research Division and Prairie Region Business Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

TECHNICAL AUDIT OF APARTMENT BUILDINGS IN TORONTO.

A representative sample of 63 multifamily rental buildings in Toronto have been audited in order to determine their condition. The buildings were examined to determine their durability, and health and fire safety aspects, and the related repair costs. The project is a joint initiative with the City of Toronto. Preliminary results show the average repair costs to be \$7,474 over ten years, not including regular maintenance or finishings. In the building envelope systems, complaints due to leaks rise from 12% in pre-60s construction to 45% in post-70s buildings. The results of this condition survey are presently being analyzed.

CMHC Project Officer: Sandra Marshall

CIDN: 1537 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

WIND-DRIVEN RAIN FOR THE GOVERNOR'S ROAD PROJECT.

Continuing previous research, this project explores the impact of cornice design in providing protection from wind-driven rain at the top of a multi-family building in Dundas, Ontario in order to better optimize the roof design.

CMHC Project Officer: Sandra Marshall

CIDN: 1123 0300013

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOME OWNERSHIP

A CANADIAN HOMEOWNER'S MANUAL.

This project responded to the information needs of the housing consumer and developed an owner's manual that is comprehensive and can be made specific to each house. The manual is of interest to homebuilders as a marketing and service tool and for reducing callbacks; and to the warranty programs as a means of conveying good house maintenance and operation practices to the home owner. A national advisory committee oversaw the evolution of the manual and ensured that the views and experience of builders and warranty programs were considered. Focus group testing was conducted first on the idea of the manual and subsequently on the completed draft version. Consumers were enthusiastic about the idea and praised the product. The final, formatted text of the manual is ready and the publication is scheduled for release in 1999.

CMHC Project Officer: Fanis Grammenos **CIDN:** 1559 0200002 **STATUS:** Ongoing Project

Division: Research Division

AVAILABILITY: Publication not yet available

HOUSE CONSTRUCTION

APPLICATION OF STRUCTURAL STEEL TO SINGLE-FAMILY RESIDENTIAL CONSTRUCTION.

The objective of this project is to investigate the use of structural steel in single-family residential construction, and analyze its applicability to Canada, taking into account technical requirements, cost-effectiveness and sustainability.

CMHC Project Officer: Rob Duncan

CIDN: 1831 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Michel De Spot, Director, Node Engineering
2703 124B Street
Surrey, British Columbia, V4A 3N8

AVAILABILITY: Publication not yet available

CSA Z-824 STANDARD.

The objective of this project is to take the existing draft of the CSA Z-824 Log Standard, rationalize the organization of the standard contents, and produce a draft for comment.

CMHC Project Officer: Rob Duncan

CIDN: 1811 0300001

Division: Research Division

STATUS: Ongoing Project

DEVELOPMENT OF COMMERCIALLY VIABLE CONCEPTS AND A DESIGN FOR A RESIDENTIAL FRAMING SYSTEM FOR A MONOCOQUE HOUSE.

The purpose of this project is to undertake the development of commercially viable concepts and a design for a residential framing system for a monocoque house, to provide on-site guidance during the construction of prototypes of the design and to undertake post construction performance monitoring of the structures.

CMHC Project Officer: Rob Duncan

CIDN: 0657 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

EASY-ACCESS THRESHOLDS TO BALCONIES: PROBLEMS AND POSSIBLE SOLUTIONS

The objective of this project is to provide architects, builders, developers and regulatory agencies with a tool demonstrating the possibilities of producing easy-access thresholds to balconies in new or renovated residential buildings.

CMHC Project Officer: Sandra Marshall

CIDN: 1995 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Pierre Richard
4800 Marquette Street
Montreal, Quebec, H2J 3Y7

AVAILABILITY: Publication not yet available

LABOUR SHORTAGES IN RESIDENTIAL CONSTRUCTION.

The purpose of this project is to examine the available evidence concerning the extent of labour shortages in the residential construction industry; and document the overall labour supply situation in the residential construction industry.

CMHC Project Officer: Jamie Angus

CIDN: 1860 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

STUDY OF SEAM TELEGRAPHING IN RESIDENTIAL FLOORING.

A CHBA led research project was conducted, in partnership with Macmillan Bloedel, the Canadian Plywood Association, the Canadian Particleboard Association, the Industrial Research Assistance Program of N.R.C. and CMHC. This research identified that the seam telegraphing problems in residential flooring currently being experienced by the housing industry are predominantly attributable to site conditions which lead to complex interactions between layers of materials. Of greater significance than that of material type, are the installation practices followed. Moisture problems, for a number of different reasons from material acclimation to construction material generated moisture (i.e.: floor slabs), are the main reason for this problem. The findings have been incorporated into the new publication, "Building Solutions - A Problem Solving Guide for Builders and Renovators".

CMHC Project Officer: Darrel Smith

CIDN: 1729 0300001

Division: Research Division

STATUS: Completed

AVAILABILITY: See above.

TALL WALL" CONSTRUCTION DETAILS.

The purpose of this project was to develop a series of cost-effective, common design and construction details, certified by a structural engineer registered in the province of Alberta, for typical "tall walls", such as walls exceeding the maximum height permitted by the building code. The project and development of the report/booklet was managed by the Alberta Home Builders' Association on behalf of the Alberta Housing Industry Technical Committee (AHITC). AHITC is an alliance of major organizations (builder associations, Alberta New Home Warranty Program, Municipal Authorities and CMHC) which serves as the technical forum for the residential sector in Alberta. AHITC is responsible for the production and the distribution of the booklet to their members.

CMHC Project Officer: Darrel Smith

CIDN: 2037 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSING DESIGN

AFFORDABLE, VERSATILE HOUSING.

This project identifies and describes house designs that enable a house to accommodate a range of household types, sizes and needs by means of their adaptability. It documents the features of designs from built examples and it explains their economic and use advantages. The set of designs to be included will cover all housing forms, from detached houses to apartments. This first guide on adaptable designs will be made available both in hard copy and electronic format via the Internet. Publication is expected in the Spring of 1999.

CMHC Project Officer: Fanis Grammenos

CIDN: 1783 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

FLEXHOUSING DESIGN DEMONSTRATION.

CMHC's FlexHousing is a new and innovative approach to home design, renovation and construction, able to adapt and convert affordably as people's lifestyles change. This exciting and practical approach to designing and building housing of all kinds - from single family, duplexes, multi-unit and even apartments allows residents to convert space to meet their changing needs.

Imagine housing that is planned in advance for sub-dividing rooms, expanding space or converting attics and garages to bedrooms, family rooms, home offices or self contained suites. FlexHousing is housing for today, a modern trend in the United Kingdom, the United States and Europe. In January 1996, CMHC launched the FlexHousing Design Competition. The national winner was Nicholas Varias Architect of Nouvelle Development Corp., London Ontario. Awards of merit were given to: Ron Wickman Architects of Edmonton; McGill University; Avi Friedman, Anobid Construction of Montreal; Stephane Hazan Architects of Laval. The first demonstration house opened in Edmonton in October 1997.

The Canadian Centre for Housing Technology at the National Research Council will feature the winning FlexHouse Design in its Information Centre, opening in the Spring of 1999. More information will be available on the CMHC Home page.

CMHC Project Officer: Tom Parker

CIDN: 1389 0300

Division: Research Division

STATUS: Ongoing Project

INDOOR ENVIRONMENT

DEVELOPMENT OF MATERIAL EMISSION TEST STANDARDS.

Improved test standards for emissions from caulks and sealants and urethane foam are currently being developed. These standards, currently in draft, are now being considered within the American Society for Testing and Materials (ASTM) process. NRC/IRC has developed a draft emission test standard for VOCs from pressed wood products. Revisions are being made to these draft standards in response to an ASTM committee ballot and will be resubmitted again this year, using new CMHC support funding, as requested by the Task Force on Material Emissions. It is anticipated that the ballot will be passed for inclusion of these standards into the ASTM process.

CMHC Project Officer: Virginia Salares

CIDN: 1244 0201003

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

A GUIDE TO MECHANICAL EQUIPMENT FOR CLEAN INDOOR ENVIRONMENTS.

Complementing the "Building Materials for the Environmentally Hypersensitive", this publication deals with heating, ventilating, air and water purification equipment for housing requiring special attention to air quality. The document is a reference guide for selecting new mechanical equipment for new construction or retrofits. The document includes discussions of the applicability of the equipment to environmentally hypersensitive individuals. The guide will be available in 1999.

CMHC Project Officer: Virginia Salares

CIDN: 1031 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HEALTHY MATERIALS, AN INTERNATIONAL COMMUNIQUE ON MATERIAL EMISSIONS.

This periodical, designed specifically for researchers (worldwide) on material emissions, is a communication vehicle on issues, progress, contacts and standards. It has been set-up on the Internet as a twice-yearly publication. Hard copies are also available from CMHC. Four issues are currently available, with two more expected in 1998.

CMHC Project Officer: Virginia Salares

CIDN: 1244 0201

Division: Research Division

STATUS: Ongoing Project

INDOOR AIR POLLUTION FROM ATTACHED GARAGES.

CMHC is contributing to a Health Canada/Environment Canada project investigating the infiltration of garage-based pollutants into houses. Twenty-five Ottawa houses have been tested to determine the leakage area between the house and the attached garage. Pressure differentials were recorded and pressure testing was repeated during the winter months. The current work includes modeling of the IAQ implications and monitoring of pollutant entry when the garage is occupied by a "calibrated" car. So far, modeling has not been very successful. Further field testing will take place in the winter of 1998/99. Health Canada will be publishing the project reports.

CMHC Project Officer: Don Fugler

CIDN: 1910 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INDOOR AIR QUALITY TRAINING PROGRAM.

A program to train indoor air quality problem inspectors has been developed and piloted. The program consists of a three-day course, followed by a field training phase. Pilot testing indicated that candidates for the program should have some expertise in building science and mechanical systems. A one-day "Let's Clear the Air" seminar has also been developed for other industry interest groups. This one-day seminar is a prerequisite to the three-day evaluators' course. Eleven trainees took the first three-day course and are going through the apprenticeship stage.

The 1998 schedule will include a new one-day field training session for building officials and public health inspectors in addition to the one-day seminars and the three-day course.

CMHC Project Officer: Virginia Salares

CIDN: 1623 0300017

Division: Research Division

STATUS: Ongoing Project

THE PRINCE EDWARD ISLAND BIRTH COHORT STUDY OF MOLD IN HOMES.

This joint study between CMHC, Agriculture Canada, Health Canada and others will ultimately look at several hundred homes in Prince Edward Island to determine the biological exposure, house performance parameters and energy use characteristics of a statistically-representative set of houses occupied by newborn babies. Part of the study will follow the health of these babies to determine the degree to which damp and moldy houses result in increased infant health problems. Ongoing sampling of the house biological matter will occur in a subset of the "good" and "bad" houses. The first year of the study has been completed. Indications are of a high incidence of health problems and high levels of moisture and mold in the houses. Data is being analyzed. Additional funding has been approved for a second round of house and occupant tests.

CMHC Project Officer: Ken Ruest

CIDN: 1618 0300001- 2

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RELIABLE METHODS FOR HEAT EXCHANGER LEAKAGE TESTING.

The goal of this project was to select, field test and demonstrate reliable and quantitative methods for furnace heat exchanger leakage testing. A survey was conducted on heat exchanger leakage test methods used by 40 Canadian and American utilities. This report is currently available from CMHC.

Research was also conducted on thirteen furnaces that had been "red-tagged" in the field. A test protocol was selected as being the most reliable for correctly predicting high levels of furnace heat exchanger leakage. The Canadian Gas Research Institute (CGRI), looked into variations upon this basic test, and found flaws in each test procedure. Additional test procedures were volunteered but did not prove more successful in the lab. If a more reliable test method is identified in the near future, it will be tested. However, in the research to date, no heat exchanger crack test method has shown itself to be worthy of promotion.

CMHC Project Officer: Don Fugler

CIDN: 1505 0200004

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SOIL GAS VOC INTRUSION RESEARCH.

CMHC is contributing to a multi-agency project which is looking at the rate and predictability of volatile organic compounds (VOC) into buildings located on contaminated soils. The contractors have reviewed the available models and are collecting data at a BC test site.

CMHC Project Officer: Don Fugler

CIDN: 1826 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Martin Adomait, President, Adomait Environmental Solutions Inc.
160 Cyprus Drive
Kitchener, Ontario, N2M 4R5

AVAILABILITY: Publication not yet available

A STUDY OF HOUSE RETURN AIR SYSTEMS USING FLOOR JOIST SPACES.

Research was conducted on air in houses that is distributed through the ducting system consisting of supply ducts and a return air plenum. Floor joist spaces are being used as return plenums in new construction and this study characterizes the indoor air in a number of houses with return air plenums made of all metal, combinations of metal, solid wood, plywood or oriented strand board. A Research and Development Highlight sheet is being prepared.

CMHC Project Officer: Virginia Salares

CIDN: 1704 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

A STUDY ON THE EFFECT OF CONTROLLING THE HOME ENVIRONMENT ON ASTHMA.

Six houses having one or more individuals suffering from asthma and in which the occupant's symptoms are linked to the house were inspected following the CMHC Residential IAQ Investigation Protocol. All houses were found to be severely moldy. The houses were subjected to tests for various indoor air parameters - CO₂, VOC's, dust mite allergens and molds. Mold tests confirmed the inspection findings. Five of the homeowners proceeded with a remediation. Compliance with recommendations of the study varied from partial to full. The health status of the asthmatic occupants was monitored during the study. Health improvement of the occupants correlated with the degree of improvement of the air quality of the houses.

CMHC Project Officer: Virginia Salares

CIDN: 1621 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available.

SUPPORT FOR THE CONSORTIUM FOR MATERIAL EMISSIONS AND INDOOR AIR QUALITY MODELING.

CMHC is an active supporting member on the steering committee and technical committee of a consortium established by the National Research Council, Institute for Research in Construction to develop protocols for testing materials and furnishings and for modeling the impact of those emissions on indoor air quality. Funds are being used to increase the database of materials tested to the new standards, in a house being built on the NRC campus.

CMHC Project Officer: Virginia Salares

CIDN: 1244 0200004

Division: Research Division

STATUS: Ongoing project

INDOOR ENVIRONMENT

TASK FORCE ON MATERIAL EMISSIONS.

This Task Force meets twice annually to discuss issues related to chemical emissions from building materials and to help direct Canadian efforts in this field, including prioritizing future activities. During a previous meeting held in the fall of 1995, three jointly-funded projects were approved. The draft final report, "Round-Robin Testing of Volatile Organic Compounds (VOC) Emissions from Common Building Materials" has been received. The final report is expected to be completed and available in May 1998.

The final of the paint report, "A Review of VOC Emissions and Drying Mechanisms for Interior Paints and Coatings" and the odor study, "Material Odor Emission Test Methods: Review and Evaluation" are available from CMHC's Canadian Housing Information Center. Seven additional resolutions concerning material emissions and health and future research were adopted by the Task Force during a January 1998 meeting. They also recommended setting up a Working Group on IAQ and health. Interested parties are solicited.

CMHC Project Officer: Jim Robar

CIDN: 1894 03000011244 0201008

Division: Research Division

STATUS: Ongoing project

LIGHTING

TESTING THE ADEQUACY OF RESIDENTIAL LIGHTING IN A CARE CENTRE: NEW AGE-ADJUSTED NORTH AMERICAN ILLUMINATION STANDARDS.

The objective of this research is to undertake a field study on the effectiveness of lighting in two residential centres with remarkably different lighting levels.

CMHC Project Officer: Virginia Salares

CIDN: 2020 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Dr. Doris L. Milke
The Capital Care Group, McConnell Place North
9113-144 Avenue
Edmonton, Alberta T5E

MANUFACTURED HOUSING

COMPARISON OF THE NATIONAL BUILDING CODE, CAN/CSA-Z240 MH AND HUD PART 3280 MOBILE HOMES.

In Canada, mobile homes are usually built to the CAN/CSA-Z240 MH standard, (Z240). The National Building Code, (NBC), forms the basis for regulating all site-built housing. In the United States, the mobile home industry operates under the Housing and Urban Development (HUD) code. The MHI of Canada (MHIC) has suggested that there may be situations where the NBC and its provincial equivalents or the Z240 standard have more stringent requirements than are required for occupant health and safety. MHIC also believes that there may be other approaches to the construction of housing that will deliver an equivalent unit of housing but at a reduced cost. CMHC, in association with MHI Canada and the Canadian Manufactured Housing Institute (CMHI), is undertaking a comparative study of practices under the three different approaches to examine if there are non-health and safety related code/standard differences that affect production costs.

CMHC Project Officer: Doug Pollard

CIDN: 1939 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

MANUFACTURED HOUSING: CREATING COMMUNITIES.

This short video was produced by the Canadian Manufactured Housing Institute with guidance from CMHC's Research Division and with financial support from CMHC. The goal of the video is to increase the range of housing choices available to Canadians. Featuring homes and communities from coast to coast, housing that provides lifestyle choices in land lease communities is visually demonstrated in this twelve minute video.

Incorporating affordable housing choices has become a real challenge for today's planners and officials. No longer sponsored by government agencies, the continuing supply of affordable housing options becomes the responsibility of local government officials and the private sector. Manufactured housing is ideally positioned to provide affordable housing choices in a quality home product.

Primarily an educational tool, this video encourages planners and zoning officials to explore affordable housing options by including manufactured housing communities in municipal and rural plans. Visual displays of successful communities, combined with standard models, testimonials from planners, developers and home buyers will dispel the myths and prejudices surrounding manufactured housing communities today.

Additional target audiences include developers, financial institutions, and government agencies.

Ottawa: Canadian Manufactured Housing Institute, 1998.

Price: \$10.00

STATUS: Completed Video

AVAILABILITY: Canadian Manufactured Housing Institute
500 - 150 Laurier Avenue West
Ottawa, Ontario K1P 5J4
Tel.: 613-563-3520 Fax.: 613-232-8600
Email: cmhi@cmhi.ca

NOTE: Disponible aussi en français sous le titre: *Habitation usinée: pour créer des communautés*

OPTIMUM VALUE ENGINEERING STUDY OF THE CANADIAN MANUFACTURED HOUSING INDUSTRY.

The Canadian Manufactured Housing Institute (CMHI), with CMHC, undertook an Optimum Value Engineering (OVE) study to examine the product engineering and manufacturing processes of the Canadian manufactured housing industry. Phase I of the project comprised literature reviews of international advances in manufactured housing, site visits to US and Canadian plants and an industry survey questionnaire. Among the important findings are the significantly expanded role for computers in the industry and the lack of use of foam adhesives in Canadian manufactured housing. Reports from Phase I can be obtained from the CMHI. Phase II began in August 1997 and undertook further studies of the potential for use of foamed adhesive to attach interior finish materials to framing, and less material-intensive floor-framing details that retain the necessary structural properties. Phase II is now complete. Contact the CMHI for information.

CMHC Project Officer: Silvio Plescia

CIDN: 1597 0200001

Division: Research Division

STATUS: Completed

AVAILABILITY: Publication not yet available



: See the following other studies on manufactured housing::

page 88 "Export Performance and Needs of the Canadian Manufactured Housing Industry"

page 89 "Opportunities for Canadian Factory Build Housing in the Southeastern United States"

ATTIC VENTING, ATTIC MOISTURE, AND ICE DAMS. ABOUT YOUR HOUSE; CE13.

This informative factsheet tells the homeowner what to do if water is coming through the ceiling, if they have a wet attic or ice damming. It explains what they may expect to see in the attic and includes handy illustrations, tips on where to look for leaks and what to use to seal them. The article also recommends useful publications, web sites and alternate sources of information.

This handy article guides the homeowner through the steps for problem identification and presents solutions, in a friendly, easy-to-read format.

The primary audience is homeowners, but it may be of interest to property managers, municipalities, emergency planners, inspectors, etc.

Ottawa: Canada Mortgage and Housing Corporation, 1999.

STATUS: Completed Factsheet, 2 pages.

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre: *Ventilation du vide sous toit, humidité dans le vide sous toit et formation de barrières de glace.*

B.C. MOISTURE PROBLEMS - PHASE II.

Over the past 12 months CMHC has conducted research which has been instrumental in leading an industry-wide consortium in the development of solutions to technical problems associated with wood frame apartment building envelope construction in the coastal areas of BC. The first part of the program, a field survey, has now been completed and has confirmed that the problem is likely attributed to incorrect wall design and construction, leading to ingress of exterior moisture followed by inadequate drying rates. Two steering committees are being formed from the Building Envelope Research Consortium's membership. The project will involve retaining the services of consultants to test and monitor new details and wall constructions; to adapt the two currently available Best Practice Guides for wood frame building envelopes and flashings for the coastal region of British Columbia; to develop a Quality Assurance Protocol which would be specific to the wood frame industry envelope design and construction process; and to develop a training program in partnership with the CHBA and the AIBC.

CMHC Project Officer: Jacques Rousseau

CIDN: 1816 0300006-8

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BASEMENT WALLS THAT DRY.

Research has shown that finished basement walls, with chronic wetting, produce molds dangerous to human health. This research suggests that no basement with a history of dampness should be finished until the moisture problems are completely remedied. This project tested theoretically quick-drying basement wall systems, in hopes of being able to recommend these systems for marginal basements. They were subjected to a mid-wall leak and a 10 cm flood to measure the drainage and drying characteristics. A final report is in preparation. Only two of the ten wall types tested showed good drying response after wetting by leakage and flooding.

CMHC Project Officer: Don Fugler

CIDN: 1797 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

FIELD TESTING OF MOISTURE IN STRAW BALE HOUSES.

Straw bale construction is an innovative construction technique that is gaining popularity, particularly for rural houses. While these structures seem to be working well in the dry American southwest, the birthplace of the straw bale housing movement, it is unclear how well they will withstand extended periods of cold and damp conditions. This initiative is funding three small local investigations of straw bale house moisture content: one in several houses in Alberta/BC, one in older straw bale homes in the Gatineau area north of Hull, Québec and one in several houses in Nova Scotia. Several of the houses showed high levels of straw moisture, particularly when probes were located near the exterior walls. Further monitoring and analysis is necessary to determine whether these occurrences will jeopardize the longevity of the straw. More testing will take place in western Canada.

CMHC Project Officer: Don Fugler

CIDN: 1867 0300002,
1867 0300004

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: See above

GUIDANCE DOCUMENT ON RESIDENTIAL DRAIN TILE INSTALLATION AND MAINTENANCE.

The Center for Drainage Studies at McGill University, Montréal, Québec, drafted a publication on the installation and maintenance of drain tile around the foundation perimeter of Canadian houses. McGill surveyed contractors across the country to ascertain regional patterns of drain tile installation and failure. The publication will not be issued immediately as it may be modified as a result of further drainage research being conducted by the multi-agency basement committee.

Project Officer: Don Fugler

CIDN: 1797 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

MOISTURE IN STRAW BALE HOUSING: NOVA SCOTIA: FINAL REPORT

Given the use of straw bales as building materials in several houses in the Atlantic Canada region over the past few years, the investigators saw a need to test and monitor the performance of these houses vis a vis moisture issues. The two main areas of interest in this study were: to test the 'breathability' of straw bale walls finished with a cement-based stucco on interior and exterior surfaces; and to monitor for one year the moisture content in straw bale walls in occupied houses in the region.

Four houses in Nova Scotia were chosen for the study. Each house differs in construction and finish technique, as well as in the attention paid to air sealing techniques and roof/ceiling/floor insulation for energy efficiency. However, all four houses feature straw bale walls finished with a cement based stucco (one with a soil-cement stucco, the other three with a conventional three coat cement stucco).

'Breathability' was tested by using the CGSB standard for air tightness testing and the Minneapolis Blower Door Apparatus, as used on housing of all types and ages. The results of this test indicate how many times the volume of air within the building envelope changes at an induced pressure of 50Pa. This result is commonly used to gauge how 'leaky' any given house is, and also to discover the areas where the air leakage occurs. In all of the houses in the study, air leakage was found in the same areas as is typical to stick-frame construction of any vintage (to a greater or lesser degree): joist/header areas, wall/ceiling junction, penetrations through ceilings and walls, and incomplete air sealing at door and window frames. In the house with the lowest air test result (3.13ACH), the owner/builders had paid particular attention to air sealing in such areas as the wall/ceiling junction, the potlight and plumbing penetrations into the attic space and the spaces between the window units and the rough openings. Although this air test does not definitively prove or disprove claims of 'breathable' cement-based stuccoed straw bale walls, it does prove that air sealing techniques can be applied to any building media.

The results of the monitoring program indicate that the four houses tested have seasonal swings in moisture content, but apart from a few instances of actual water leakage into the walls (due to a leaky pipe in one case and a leaky roof in another), the average moisture content in the walls swings from readings of 6.8% in December/January to 12.2% in July, well under the 20% MC thought to be the threshold for structural and healthful damage to straw bale walls. These results auger well for those who wish to build with straw bale in this region where moisture issues due to climate can be problematic in the built environment.

Prepared by S.H.E. Consultants, Shawna Henderson, Principal Investigator. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Don Fugler. Ottawa: CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

MOISTURE & MOLD

PERFORMANCE EVALUATION OF WATER REPELLENTS FOR ABOVE GRADE MASONRY.

The objective of this project is to evaluate the performance of various water repellents for above grade masonry on a comparative basis and develop practical methods to evaluate their effectiveness. This evaluation will be based on lab analysis and field testing as well as a literature review to find available information on water repellent performance. The initial part of this study, Phase I will be conducted under the CMHC External Research Program and will examine the issue of water infiltration while Phase II will examine exfiltration.

CMHC Project Officer: Jacques Rousseau

CIDN: 1696 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PREVENTING MOISTURE AND MOLD PROBLEMS IN YOUR HOME; CONSUMER'S BROCHURE.

This handout will advise consumers: a) how to hire a competent clean-up contractor; b) how to hire a moisture problem renovation contractor; and, c) what they must do to prevent future mold problems once a clean-up (and renovation) has been performed on their home. It covers occupant habits, maintenance, keeping indoor surfaces warm, use of ventilation systems, etc.

CMHC Project Officer: Ken Ruest

CIDN: 1030 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RAIN PENETRATION CONTROL SEMINAR.

Water penetration is a frequent, recurring problem for building owners, leading to damage of building components, interior finishes and building contents. It frequently leads to high repair costs and possible litigation. Over the past few years, research undertaken by CMHC, has contributed to the understanding and the prevention of rain penetration. In particular the pressure-equalized rainscreen has been applied and refined. In this seminar the causes of rain penetration will be examined. The results of CMHC research will be presented, along with design features and practical details, which will help prevent rain penetration in a variety of wall types. This full day seminar is targeted to architects, engineers, specifiers, builders, developers and building owners concerned about rain penetration and how to prevent it. The seminars will be presented in Toronto, Winnipeg, Edmonton, Vancouver, Montreal and Quebec City. This seminar was developed in cooperation with the Canadian Masonry Association, the Canadian Precast Concrete Institute and the Exterior Insulated Finish Systems (EIFS), curtain wall and steel manufacturers.

CMHC Project Officer: Jacques Rousseau

CIDN: 0838 0303005

Division: Research Division

STATUS: Ongoing Project

RE-INSULATION OF EXISTING FLAT-ROOF MULTI-FAMILY BUILDINGS IN QUÉBEC.

A joint project with Hydro Québec to examine ways of re-insulating low-rise multi-family buildings for energy efficiency, without causing moisture problems in the attic. Field testing was complete in early summer 1997. A final report has been submitted. CMHC is discussing with Hydro Québec on the best way to disseminate the results.

CMHC Project Officer: Don Fugler

CIDN: 1377 0801001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

REMOVING ICE ON ROOFS. ABOUT YOUR HOUSE; CE15

The ice storm that hit eastern Canada in January 1998 provided many cases on which to research the removal of ice accumulation on roofs. This factsheet identifies what to do in an ice storm emergency, explains how to tell when there is a problem with both sloped and flat roofs, and the best methods for ice removal. The article also identifies those methods which had no or only moderate success. Heavy emphasis is placed on personal safety, and the recommendation to leave the work in the hands of the professionals.

This article provides the homeowner with valuable information about the removal of ice, in an easy to read format. The primary audience is homeowners. It may also be of interest to property managers, municipalities, emergency planners, inspectors etc.

Ottawa: Canada Mortgage and Housing Corporation, 1999.

STATUS: Completed Factsheet, 5 pages, 8½ x 11, black and white

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre: *L'enlèvement de la glace sur les toitures*

SOLVING MOISTURE PROBLEMS IN A HOME: A RENOVATOR'S GUIDE.

This guide for renovators includes renovation solutions required in moisture troubled houses to prevent the recurrence of moisture and related mold problems. Included in the guide will be sections on water entry control, insulation, ventilation and plumbing/piping tips relevant to Canadian housing, as well as information from the draft document, "Modifying Your House So It Won't Grow Mold." It is being reviewed and release is expected in the Winter of 1999.

CMHC Project Officer: Ken Ruest

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

☞ See also items in the *High-Rise and Multiple Unit Construction* Section, p. 36-44.

INNOVATIVE FOUNDATIONS, HEATING & VENTILATION.

This R&D&C (research, development, commercialization) project and first stage monitoring is complete and a report due before the end of 1998. CMHC, Yukon Housing Corporation (YHC) and Yukon Energy partnered in building two research/demonstration houses in Dawson City, Yukon. This work is a continuation of previous successes in R&D&C of the space frame foundation technology now being exported to Alaska. The thrust of the current foundation work is to reduce cost, develop a technology that can be locally manufactured and reduce the height of the crawl space.

A torque tube HSS steel section is under one house. The other house will be an extension of the sheet metal reinforced plywood monocoque technology resting on three bearing points. Lots of ground movement has been reported so the test site is proving to be a good demonstration. After a review of northern and remote technology, the heating and ventilation systems incorporate and optimize energy efficiency, minimal equipment and sustainable ventilation operation. Construction is complete and the houses are occupied. Commissioning of the project was a large task and the systems appear to be running efficiently at about half the energy consumption of a typical northern house. The mechanical technology was used on another YHC project at substantial capital savings and with some modifications appears to be the technology of choice. Work is underway to develop a more cost effective and simple foundation system.

CMHC Project Officer: Rob Duncan

CIDN: 1676 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

NoRTH WEB-SITE.

The purpose of this partnership project is to design, establish and maintain a dedicated NoRTH Web-Site for a two year period. The project partners are CMHC, Alaska Housing and Finance Corporation, and Yukon College. The web-site includes relevant technical information such as factsheets of research reports and the Frostline newsletter. It also includes discussion groups to provide a means of ongoing and current communication. The web-site has links to other relevant web-sites and can be visited at www.NoRTH-RTHN.org.

CMHC Project Officer: Darrel Smith

CIDN: 1886 0200001

Division: Research Division

STATUS: Ongoing Project

A BETTER WAY TO RENOVATE.

This booklet presents seven outstanding renovation projects with different sets of renovation challenges and solutions. These demonstrations are based on the concepts of the house-as-a system, energy retrofitting and healthy housing. Together, they demonstrate how a house of any age can be turned into a healthy, comfortable and energy-efficient home.

Ottawa: Canada Mortgage and Housing Corporation : Natural Resources Canada : Canadien Home Builders' Association, c1998.

Order no. NE2174

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069«
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre: *Une meilleure façon de rénover*

THE CANADIAN ASSOCIATION OF HOME AND PROPERTY INSPECTORS INITIATIVE.

The Canadian Association of Home and Property Inspectors (CAHPI) is a newly formed association that will represent all of the private home inspectors in Canada. This association is comprised of a number of national and provincial associations, including some of the major franchises, and a number of independent inspection firms. CAHPI currently represents over 600 private home inspectors, but it is anticipated that other, non-affiliated private home inspectors will increase this number in the future. Formal agreements and establishing their future requirements is currently being undertaken. A CAHPI Board has been established and they are now proceeding with setting-up and determining the responsibilities of the various committees such as, By-Laws, Accreditation and Certification, Strategic Relations, Education, Standard of Practice and Code of Ethics, and Discipline. They have submitted a proposal to Human Resources and Development Canada requesting assistance to complete an occupational skills analysis. CMHC continues to support this initiative.

CMHC Project Officer: Darrel Smith

CIDN: 1962 0200002

Division: Research Division

STATUS: Ongoing Project

THE CANADIAN RENOVATION INDUSTRY AND THE INTERNET: USAGE PATTERNS, 1998-2001.

The objective of this project is to survey renovators about their use of e-mail, web-sites, and interactive online communications.

CMHC Project Officer: Darrel Smith

CIDN: 2015 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Donald M. Caskie
R.R.2
Paris, Ontario N3L 3E2

AVAILABILITY: Publication not yet available

THE HEALTHY HOUSING RENOVATION PLANNER.

The purpose of this project is to develop a consumer renovation book that will focus on Healthy Housing. This book will look at the various renovation projects commonly undertaken and will provide the consumer with the information they require to plan a Healthy Housing renovation. The book is expected to be available by the Spring of 1999.

CMHC Project Officer: Darrel Smith

CIDN: 1760 0300002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOMEOWNER MOTIVATION AND INNER CITY REVITALIZATION: AN EXAMINATION OF RELATED FACTORS IN WINNIPEG.

The objective of this research is to identify the revitalization process underway (e.g.) incumbent upgrading or gentrification in inner city areas demonstrating a high level of renovation activity.

CMHC Project Officer: Glynis Kossatz

CIDN: 1277 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Tom Carter

University of Winnipeg
Dept. of Geography
Winnipeg, Manitoba
R3B 2E9

AVAILABILITY: Publication not yet available

HOW HEALTHY IS YOUR HOUSE: CMHC HOMEOWNER'S AND HOMEBUYER'S CHECKLIST FOR MAINTENANCE AND REPAIR.

The current CMHC's Homeowner's and Homebuyer's: Inspection Checklist for Maintenance and Repair is being revised to both update and include a Healthy Housing evaluation "tool". It will provide homeowners and homebuyers with a pre-purchase or pre-renovation guide for performing an inspection on their house. Physical condition, IAQ, energy and environmental and maintenance and repair information will be included in the document. It will be beneficial in enabling consumers and homebuyers to make more informed decisions prior to hiring the assistance of a private home inspector should the need arise. This advisory document will be available in the Spring of 1999.

CMHC Project Officer: Darrel Smith

CIDN: 1901 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PROMOTING HEALTHY HOUSING AND ENERGY EFFICIENCY APPROACHES IN MAJOR HOME RENOVATIONS: A CASE STUDY ANALYSIS. FINAL REPORT.

The current and potential interest of renovating homeowners and renovation professionals in Healthy Housing concepts and approaches was explored through a set of twelve detailed case studies of recent renovations. For each renovation, an analysis of opportunities to integrate Healthy Housing approaches and features was used as a basis for exploring the issues in a concrete way. The intent was to gain insights on ways to better motivate and inform homeowners and professionals about how to improve renovations in relation to the Healthy Housing objectives of energy efficiency, air quality/occupant health, resource efficiency, environmental responsibility, and affordability/adaptability.

Based on the research, it appears that a limited number of Healthy Housing features have become, or are becoming, relatively common in renovations. On the other hand, awareness of many other Healthy Housing features was very low amongst both the homeowners and the renovation professionals interviewed. While it would likely be difficult to motivate and inform most homeowners to the point where they proactively make Healthy Housing choices -- especially in decisions related to building systems versus finishes -- many homeowners may be interested in simple tools that would provide them with a basis for raising Healthy Housing issues with their renovation professionals. Similarly, while renovation professionals may not see direct competitive advantage in promoting Healthy Housing approaches and options, many would likely be willing to provide objective (third party) information on Healthy Housing options to clients. The research points to a number of formats and venues for informing renovating homeowners and renovation professionals, and provides a set of recommendations on how to target efforts.

Prepared by Marbek Resource Consultants. Marbek Project Manager: Rebecca Aird. Prepared for: Research Division, Canada Mortgage and Housing Corporation. CMHC Project Manager: Don Fugler. Ottawa: CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

RENOVATION OF GENERIC HOUSING STYLES - POST-WAR ONE-AND-A-HALF STOREY.

The objective of this project is to provide consumer information on typical approaches to the repair and renovation of post-war one-and-a-half storey houses. Criteria for these approaches will include occupant lifestyle and needs, structural and maintenance requirements, "Healthy Housing" improvements (including environmental and energy-efficiency), and the impact on home equity and resale value. CMHC is preparing the document for publication, likely in mid 1999.

CMHC Project Officer: Don Fugler

CIDN: 1430 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RENOVATOR TRAINING IN CANADA: AN EVALUATION AND SITUATION REPORT.

The purpose of this project was to investigate the current situation with respect to renovation contractor training in Canada. A situation report was produced to determine who else is providing training for the residential construction industry with a focus on the renovator. Other issues related to this include marketing, financing, existing materials, relationship to certification, native initiatives, and options for delivery that reach beyond current CHBA membership, (i.e.: community colleges, private firms, etc.). The format and method of delivery was also researched (i.e., five day, correspondence, computer-based, etc.).

CMHC Project Officer: Darrel Smith

CIDN: 2044 0200002

Division: Research Division

STATUS: Completed

AVAILABILITY: Publication not yet available

TOXIC MOLD CLEAN UP PROCEDURES: A GUIDE FOR CONTRACTORS.

This guide provides advice to speciality cleanup contractors on how to clean up a house contaminated with toxic molds, such as *Stachybotrys chartarum*, including how to protect workers and occupants. A separate guide will be developed on how to renovate to prevent moisture problems (ventilation, moisture source control and surface temperature control). The first three drafts have been reviewed by public health officials (including the Center for Disease Control in Atlanta, Georgia) and selected mold and building science researchers and their comments incorporated. The format of the document is designed so that it could be used contractually by public health agencies. The document is in production.

CMHC Project Officer: Ken Ruest

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SUSTAINABLE DEVELOPMENT & HEALTHY HOUSING

ACTION PLAN FOR REDUCING GREENHOUSE GASES IN RURAL COMMUNITIES.

The purpose of this project is to prepare an integrated planning strategy that would provide guidance for rural municipalities across Canada facing the challenges of developing action plans for achieving Kyoto targets for reducing greenhouse gas (GHG) emissions. A rural Canadian community that will be developing an action plan for reducing GHGs will be selected for study. Funding will be directed to documenting the development of the action plan to ensure that the appropriate actions are considered, implemented, monitored and the results disseminated. The objective is to provide an innovative, comprehensive planning approach for rural communities that integrates transportation planning, land use planning, new housing and retrofits, waste management, economic development and the regulatory environment.

CMHC Project Officer: Susan Fisher

CIDN: 2105 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

COMPARISON OF COSTS AND RESOURCE-EFFICIENCY OF SEVEN RESIDENTIAL LANDSCAPE OPTIONS.

This research study is to quantify and compare the annual horticultural inputs (i.e. materials), time, costs and environmental impacts associated with maintaining seven different landscape types. After annual inputs are determined, the capital and life-cycle costs for a typical residential lot will also be calculated. The seven landscape types will include (in post-establishment growth states): wildflower meadow/prairie; naturalized woodland/shade garden; xeriscape; lawn area with hardy, low maintenance species; manicured lawn with conventional species; ornamental shrubs and trees; and annuals and perennial borders. The study will assess the potential environmental impacts of each option as well as their aesthetic and functional implications. In addition, potential benefits, such as wildlife habitat, bio-diversity and reduced storm water run-off will be identified and quantified. The final product will be a publication intended for municipal decision makers, advisors in planning and environmental management departments, homeowners and property managers. It will show how they can save resources, reduce environmental impacts, as well as save money and time through reductions in horticultural inputs.

CMHC Project Officer: Susan Fisher

CIDN: 1976 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CONSTRUCTION RESOURCE MANAGEMENT COURSE - PHASE II.

A private and public sector consortium has been established to develop a methodology for assisting industry to better understand, control and reduce the levels of construction, renovation and demolition (CRD) waste. To date, the partners include Industry Canada, Canada Mortgage and Housing Corporation, Alberta Environmental Protection, NWT Department of Resources, Dept. of National Defense, and PCL Constructors Canada Inc. Phase I, to be finalized by early 1999, is the development of a CRD training course that will be published in hard copy. The course will provide practical and comprehensive understanding of resource management issues in the Canadian CRD industry. It is intended for project managers which include, but are not limited to: engineers, architects and CRD contractors. Phase II will consist of an Internet based CRD project management course that will: provide current resource management information and case-specific solutions; contribute to the development of standard managerial practice; promote widespread communication of the best resource recovery techniques, contribute to economic growth and job creation; promote long-term behavioral change; and help industry associations and government departments meet mandated environmental targets. The project has a planned completion date for the Summer of 1999.

CMHC Project Officer: Darrel Smith

CIDN: 2032 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

DEMONSTRATION OF HEALTHY HOUSING ON RESERVE.

This project formerly reported as "Water & Sewage Disposal in Northern & Remote Locations" will now form part of the Northern Healthy House initiative. The objectives are to support the design, construction and demonstration of eight on-reserve Healthy Houses in 1999/2000 (Quebec, Ontario, Manitoba, Northwest Territories). This initiative will demonstrate alternative Healthy Housing designs with features appropriate for remote communities. Alternatives to conventional energy, water and sewer infrastructure will be researched, including a prototype "CHUM" - a Combined Heating & Utilities Module which can serve a single house or a cluster of houses. Several house designs are nearing completion (bungalow, one-and-a-half storey) and will be reviewed in community focus groups. Construction will commence in the Spring of 1999 with the public demonstration beginning in the Fall of 1999. House construction will be by locally trained trades and specialists. A CMHC report will be produced detailing house costs and benefits, designs and systems at the completion of the project.

CMHC Project Officer: Chris Ives

CIDN: 1969 0200001-2

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available.

HEALTHY HOUSING COST-BENEFIT STUDY.

The objective of this project was to identify the cost and the benefits of applying Healthy Housing principles, i.e. Occupant Health, Energy Efficiency, Resource Efficiency, Environmental Impact, and Affordability to the construction and renovation of homes. The cost benefit analysis treats the Healthy Housing features individually for the benefit of both the renovation market and for new construction. The study includes Healthy Housing capital costs and effects on the operating costs, such as reductions in energy or water consumption, and identifies the hidden benefits such as occupant health and durability of materials.

CMHC Project Officer: Darrel Smith

CIDN: 1905 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HEALTHY HOUSING SEMINAR.

A two and a half hour consumer Healthy Housing seminar, with a renovation focus, has been developed and packaged for delivery. The material was based on existing material produced by the CMHC Ontario and British Columbia Regional offices. It was also updated to include recent research and to give it a national scope. Examples of case studies were included by incorporating material from the 1994 and 1996 Renovation Demonstration projects. CMHC is currently negotiating a partnership with the building supply industry for delivery of these seminars. Reno Depot will be the partner for the province of Quebec. Presenters will consist of both private presenters and the training staff of our retail partners. The seminars are being offered now in Quebec and we expect they will be held in other parts of Canada starting early in 1999.

A condensed 30-minute presentation of the Healthy Housing Seminar was also produced. This material can be used at home builder association meetings, various industry shows and conferences and also in the preparation of background documents.

CMHC Project Officer: Darrel Smith

CIDN: 1906 0200001

Division: Research Division

STATUS: Ongoing Project

MULTIFAMILY HOUSING FOR COMMUNITY SUSTAINABILITY.

This project produced information to assist developers and municipalities in developing land at higher than current average densities by means of multiple housing forms. It assembled and developed exemplary multiple housing solutions and assessed consumer demand for these. It also identified market segments and strategies to attract them to medium density housing. The report provides advice on the likely clients for medium density, multiple housing and on the project design attributes that will entice them to choose medium density (townhouses and walk up apartments) over single detached housing. Publication is expected in the Spring of 1999.

CMHC Project Officer: Fanis Grammenos, Research Division

CIDN: 1628 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

OVERCOMING THE BARRIERS TO SUSTAINABLE REAL ESTATE DEVELOPMENT IN CANADA.

The research will develop criteria by which a community might be deemed to be considered sustainable. Using these criteria it will develop a clear picture of the status of sustainable development in Canada. With the same criteria it will develop a parallel analysis of successful international projects focusing on those which successfully address problems encountered in Canada. From this comparison it will generate potential directions which might assist Canadians in overcoming barriers to sustainable real estate development.

CMHC Project Officer: Doug Pollard

CIDN: 2051 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PLANNING SUSTAINABLE COMMUNITIES.

The purpose of this project is to develop an updated advisory document on community planning and design. The updated document is intended to be a state-of-the-art report, reflecting the latest thinking in the field. The emphasis of the document will be on presenting best practices and case studies of innovative, sustainable and cost-effective approaches to community planning and design. It is anticipated to be available by mid - 1999.

CMHC Project Officer: David D'Amour, Research Division

CIDN: 1553 0200001

AVAILABILITY: Publication not yet available

STATUS: Ongoing Project

PROTOTYPE OF THE COMMUNITY SUSTAINABILITY INDICATORS SOFTWARE.

The purpose of this project is to develop and provide a working prototype of the Community Sustainability Indicators Software which will include a working demonstration of all the elements of the software concept.

CMHC Project Officer: John England, Research Division

CIDN: 1796 0200002

AVAILABILITY: Publication not yet available

STATUS: Ongoing Project

STANDARDIZING THE PROCESS OF RESIDENTIAL DECONSTRUCTION.

The purpose of this project is to gather, review and analyze information on residential deconstruction, and determine what can contribute to ensuring that knowledgeable, appropriate and cost effective deconstruction applications and project decisions may be taken.

CMHC Project Officer: Darrel Smith

CIDN: 2022 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Derek Badger
c/o byDesign Consultants
24 Spruce Street
Ottawa, Ontario K1R 6N7

AVAILABILITY: Publication not yet available

SUSTAINABLE DESIGN CHARRETTE FOR THE SOUTH EAST FALSE CREEK NEIGHBOURHOOD OF VANCOUVER.

This project will report on the rationale and results of a design charrette structured to test the viability of sustainable community development guidelines. The report will include a brief history of the guideline development, the reasons for holding a charrette, a synopsis of CMHC research that was used, a critique of the effectiveness and value of the charrette. The report will also include planning drawings of the development area contracted by the city before and after the charrette, drawings done at the charrette itself and recommendations for charrettes in other communities.

CMHC Project Officer: Doug Pollard

CIDN: 2076 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SUSTAINABLE LANDSCAPE DESIGN FOR RESIDENTIAL DEVELOPMENTS.

The objective of this project is to highlight the link between sustainable development for housing with the condition, composition and use of native vegetation.

CMHC Project Officer: Susan Fisher

CIDN: 1466 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Karen Vagelatos, Vagelatos Associates Landscape Architecture Ltd.
207-2211 West 4th Avenue
Vancouver, British Columbia, V6K 4S2

AVAILABILITY: Publication not yet available



: Also see the following study on sustainable development

Page 89 : Sustainable Development in Canada

DISCUSSION PAPER ON WATER REUSE - NEEDS, TRENDS AND CASE STUDIES.

This project will serve as a basis for discussion with agencies involved with water infrastructure, research groups, potential manufacturers of water technologies, and the general public. The research will identify water technologies, discuss performance through case studies, and highlight areas in Canada that are in need of such technologies. The final report will be available in early 1999.

CMHC Project Officer: Cate Soroczan

CIDN: 1927 0200003-4

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

GREYWATER TECHNOLOGY SOFTWARE DEVELOPMENT.

CMHC is participating with Water Technology International in this research project to further develop the TECHSPEX software package to address water use, reuse and treatment. This product will provide a number of technical solutions to onsite or small community water treatment requirements based on needs that the user specifies. Costs and availability for the items specified in the solution will also be provided in the completed software. The completed software will be available in early 1999.

CMHC Project Officer: Cate Soroczan

CIDN: 1927 0200005

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INNOVATIVE ON-SITE WASTEWATER TREATMENT.

This project studied the impact of residential water conservation and on-site wastewater management on groundwater quality. In particular, it addressed the issue of nitrates in groundwater. The test site was a new, occupied rental unit containing code-approved water-conserving fixtures coupled to a novel on-site wastewater treatment system. A monitoring program determined the impact of the reduced waterflow on the baseline ground water quality. Initial loading conditions for this single house system indicated that it was possible to increase the recycling level of effluent to the Biofilter. Subsequent changes to the installation's recycling level demonstrated the potential for capacity increases and/or cost reductions. The final report has been reviewed and will be available in Spring 1999.

CMHC Project Officer: Chris Ives

CIDN: 1047 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INNOVATIVE RESIDENTIAL WATER AND WASTEWATER MANAGEMENT: WASTEWATER RECYCLING AND REUSE, RAINWATER CISTERN SYSTEMS, AND WATER CONSERVATION.

The purpose of this report is to make those responsible for planning and management of water and wastewater systems aware of, and to provide information about, three technologies that have the potential to address water and wastewater problems that face, or will face, many Canadian communities: wastewater recycling and reuse, rainwater cistern systems (RWCS), and water conservation. Most of this report addresses recycling and reuse of wastewater for non-potable applications, because water conservation, and to a lesser extent RWCS, are more widely used and accepted and more completely documented.

Section 1 provides the background to and methodology used in this project, and reviews terminology used in discussion of wastewater reclamation, recycling, and reuse. Section 2 identifies areas and situations in Canada that might benefit from use of the technologies. Problems exist from coast to coast, from north to south, and in both urban and rural areas. Section 3 deals with innovative on-site systems. Examples and references are provided for residential water conservation and RWCS, but the emphasis is on recycling and reuse in residential and other single buildings. Seventeen case studies are provided, of systems in Canada and internationally, and 15 treatment components or systems are described, which have been used, or have the potential for use, in small-scale wastewater non-potable recycling and reuse systems. Section 4 provides examples of municipal innovations in water and wastewater management. A recent Canadian report provided a summary of Canadian municipal water conservation initiatives. Examples of wastewater renovation, recycling, and reuse are drawn from many references that provide examples from around the world.

Examples of direct and indirect potable reuse are reviewed, and information is included about systems where these options have been investigated or used; but most of the examples relate to wastewater reuse for non-potable purposes such as irrigation, or dual municipal systems for delivery of potable and non-potable water. Potential applications for dual systems include: areas where water resources are limited, and inter-basin transfer of raw water is less acceptable than in the past; locations where water demand is expected to exceed the yield from existing facilities, and non-potable uses can be met at lower cost by reclaimed wastewater; the possibility of treating raw water from a polluted source for non-potable uses; increasing treatment requirements to meet more stringent environmental standards; and the ready availability of wastewater as a potential source of reclaimed wastewater. Dual systems have been used for toilet flushing, and for other urban public, industrial, commercial, and residential uses that include irrigation, fire fighting, cooling and process waters, construction street cleaning, and car washing.

Section 5 draws on many recent references to review issues, obstacles, and opportunities related to wastewater recycling and reuse. These include: arguments related to the need for potable reuse, and merits of non-potable reuse; health and other water quality considerations; system planning and design; management of small scale and large scale systems; legislation, regulations, and criteria; economic considerations; and research and demonstration needs.

Prepared by D.H. Waller, J.D. Mooers, A. Samostie, B. Sahely, Centre for Water Resources Studies, Dalhousie University. Prepared in collaboration with totten sims hubicki associates, Blue Heron Environmental Technology, Canadian Water and Wastewater Association. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Manager: Cate Soroczan. Ottawa: CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

THE LIVING BY WATER GUIDEBOOK.

The objective of this project is to prepare, publish, market and distribute a guidebook for waterfront residents on reducing environmental impacts of housing on aquatic and shoreline habitat.

CMHC Project Officer: Susan Fisher

CIDN: 2040 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

ONSITE RECYCLED WATER QUALITY MONITORING.

This project will identify the available water quality monitoring technologies appropriate for on-site and small community reuse and treatment systems. The study will also examine issues of merit, cost of implementation and operational factors.

CMHC Project Officer: Cate Soroczan

CIDN: 1936 0200

Division: Research Division

STATUS: Planned

AVAILABILITY: Publication not yet available

QUAYSIDE VILLAGE GREYWATER DEMONSTRATION PROJECT.

A greywater system similar to that of the Toronto Healthy House system is being implemented into a 19 unit cohousing project in North Vancouver, B.C. This system will be capable of treating greywater from sinks, laundry, and showers for reuse in showers, laundry and toilets. Initial testing will be restricted to toilet reuse only. Double plumbing has already been installed and the greywater system is being installed following the signing of a contractual agreement between the city and development regarding ongoing monitoring and maintenance. Upon completion the system will be subject to continuous online water quality monitoring and laboratory analysis to ensure that both the system and the online monitoring is working to satisfaction.

CMHC Project Officer: Cate Soroczan

CIDN: 1991 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

THE SUSTAINABLE HOME WATER SYSTEM.

The objective of this research is to develop a system which will collect rain water for non-potable uses in a house plus a grey water heat recovery and recycling system.

CMHC Project Officer: Stéphanie McFayden

CIDN: 1224 0200001

Division: Research Division, Housing Technology Incentives Program

STATUS: Ongoing Project

Grant Recipient: A.C.E. Alternative and Conservation Energies Inc.
1909-10th Avenue S.W.
Calgary, Alberta, T3C 0K3

AVAILABILITY: Publication not yet available

WATER RECYCLING DEMONSTRATION.

Research and development of greywater reuse is being undertaken in the Conservation Co-op apartment building in Ottawa. A facility in the basement filters and disinfects shower and bath water from 8 units which is reused as toilet flushing water. Initial design and component shortcomings have been identified and further upgrades of the system are being proposed. Plant performance and water quality are being measured with a report anticipated towards early 1999.

CMHC Project Officer: Stéphanie McFadyen
Division: Research Division

CIDN: 1573 0201003,
1573 0200001

AVAILABILITY: Publication not yet available

STATUS: Ongoing Project

SOCIAL AND ECONOMIC RESEARCH

ABORIGINAL HOUSING AND COMMUNITY SCENARIOS IN URBAN PRAIRIE CITIES.

This research project will explore alternative futures for the housing situation of Aboriginal peoples in selected Prairie cities. The technique to be employed is to construct a number of future scenarios for each location and to present them to a group of key people in each location and to record and analyse the ensuing discussions. A wide range of inputs would be used to construct the scenarios. Three scenarios would be used for each location - each would have a theme or story line and the basic themes would be repeated at each location. While the themes of the scenarios would be common to each location, each scenario would be "tuned" to account for local circumstance. Inputs would include, for example, demographic trends, local housing market conditions, and community plans and preferences as well as local opportunities.

CMHC Project Officer: Philip Deacon

Division: Research Division

STATUS: Planned

AVAILABILITY: Publication not yet available

FEASIBILITY AND VIABILITY OF MANAGING THE POOLED REPLACEMENT RESERVE FUNDS OF FIRST NATIONS AND URBAN NATIVE HOUSING GROUPS.

The objective of this project is to research and prepare a report which examines the feasibility and viability of managing the pooled replacement reserve funds of First Nations and Urban Native Housing groups.

CMHC Project Officer: Tina Heal

CIDN: 2084 1500001

Division: B.C. & Yukon Business Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

URBAN ABORIGINAL ACCESS TO HOUSING (AND HOMELESSNESS).

This research study will develop a longitudinal profile of Aboriginal household mobility, access to housing and homelessness using a historical interview technique. Snapshot surveys tell us that Aboriginal households are significantly more mobile than non-Aboriginal. This hyper mobility includes not only movement between reserve or home community and urban areas, but also between urban areas and within urban areas. The hyper mobility may lead to frequent difficulties in accessing accommodation, especially when coupled with the low socio-economic status of many Aboriginal households and discriminatory practices of some landlords. Some literature suggest that this combination of circumstances could be a major factor leading to Aboriginal homelessness. About 45% of the Aboriginal population live in cities and this segment of the population is expected to grow by almost half by 2016, which will likely exacerbate the situation.

CMHC Project Officer: Philip Deacon

CIDN: Plan 7-9018

Division: Research Division

STATUS: Planned

AVAILABILITY: Publication not yet available

CMHC AND YOU: CHALLENGE, INNOVATION, TEAMWORK.

The purpose of this 24 page book is to describe what the Canada Mortgage and Housing Corporation (CMHC) is all about, to outline the work opportunities available in its key business fields, and to list the qualities it is looking for when hiring new employees. The book describes the mission, vision, and values of the Corporation and tells of the challenging employment opportunities available to a wide spectrum of professionals in the following core business fields:

- housing finance;
- housing research and information transfer;
- the promotion of Canadian housing exports; and
- assisted housing.

Ottawa: Canada Mortgage and Housing Corporation, 1998.

Order number: NHA 2152

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre : *La SCHL et vous.*

YOUR HOUSING EXPERTS.

"Your Housing Experts" is a general-interest publication directed to those interested in an overview of CMHC information products, services and programs.

Ottawa: Canada Mortgage and Housing Corporation, 1998.

Order number.: NE2146

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre : *Les experts en habitation*

CHILDREN'S ENVIRONMENTS

ENVIRONMENTAL SCAN: CHILD-CENTERED DESIGN.

This project will involve preparation of an environmental scan or background report on children and housing. This document will include information on demographics, social and economic characteristics, key players, references and potential consultants, as well as housing circumstances for children's housing and living environments.

CMHC Project Officer: Tom Kerwin

CIDN: Plan 7-6683

Division: Research Division

STATUS: Planned

AVAILABILITY: Publication not yet available

CITY PLANNING & HUMAN SETTLEMENTS

BRINGING THE HABITAT AGENDA HOME.

The purpose of this project is to publish a book to inform the membership and others in the Canadian Habitat NGO network about the outcome of the Habitat II Conference and the Habitat Agenda, as well as to provide information and ideas in order to facilitate the implementation of the Habitat Agenda.

CMHC Project Officer: Louis Musto

CIDN: 1965 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

THE EFFECTS OF DEVELOPMENT CHARGES ON URBAN FORM.

CMHC recently initiated two projects looking at the effects of development charges on urban form. The first project is based primarily on a national survey of builders and developers to determine how the structure of development charges in different jurisdictions is affecting private sector development decisions related to location, density, and so on. The second study is an econometric analysis looking at the impact of development charges on housing costs, consumer housing choices, the characteristics of the new stock, and ultimately urban form.

CMHC Project Officer: David D'Amour

CIDN: 1941 0200001-2

Division: Research Division

STATUS: Ongoing project

AVAILABILITY: Publication not yet available

EVALUATION OF THE *ÉCO-QUARTIERS* PROGRAM.

The purpose of this project is to evaluate Montréal's *Éco-quartiers* program with regard to the management of the urban environment and the improvement of the living environment.

CMHC Project Officer: Susan Fisher

CIDN: 2001 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Gilles Sénécal, INRS-Urbanisation
3465 Durocher Street
Montréal, Quebec H2X 2C6

AVAILABILITY: Publication not yet available

COOPERATIVE AND NON-PROFIT HOUSING

BENCHMARKING PHYSICAL PLANT EXPENDITURES IN NON-PROFIT HOUSING.

The objective of this project is to assess expenditures and practices related to the physical plant in non-profit housing providers.

CMHC Project Officer: Duncan Hill

CIDN: 2003 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Marianne Moershel
R.R. #2, 2242 Queensborough Road,
Madoc, Ontario K0K 2K0

AVAILABILITY: Publication not yet available

CRISIS SITUATIONS IN COOPERATIVES: INCREASING UNDERSTANDING TO IMPROVE INTERVENTION.

This research project concerns crisis situations in housing cooperatives: the conditions in which they emerge, but especially the dynamics put in place to resolve them.

CMHC Project Officer: Marie Murphy

CIDN: 2018 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: André Fortin
Confédération québécoise des coopératives d'habitation
1085 de Salaberry Avenue
Quebec, Quebec G1R 2V7

AVAILABILITY: Publication not yet available

L'HABILITATION (EMPOWERMENT) DANS LES ORGANISATIONS COOPÉRATIVES: CINQ CAS DE GESTION DE COOPÉRATIVES D'HABITATION

People who otherwise never acquire the authority of an entrepreneur are afforded this opportunity in cooperatives. This form of collective entrepreneurship, however, does raise the question of how members actually partake in the activities of the cooperative and what authority they have within the organization. This research deals with the process of integrating and empowering members to take over the reins of their rental housing cooperatives. During the project performance phase, the founding members went through a number of experiences which enabled them to acquire the knowledge, skills and abilities to manage their cooperatives. The renewal of human resources in these types of organizations not only raises the issue of the training they can receive from the outside (cooperative network, groups of technical resources, etc.), but also the renewal of cooperative management practices in house, in particular, the renewal of experiences to foster the integration and empowerment of members with respect to the takeover of their organization.

The report is in two parts. The first part provides an analytical framework of participative management practices in rental housing cooperatives with emphasis on empowering members regarding the takeover of their organization. The second part contains five management cases based on real-life experiences in housing cooperatives. The report also includes a methodology and a bibliography.

Prepared by Marie J. Bouchard and Marc Gagnon. CMHC Project Officer: Michel Brûlé. Ottawa: Canada Mortgage and Housing Corporation, 1998 (External Research Program).

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

CRIME PREVENTION

SAFE COMMUNITIES: INFORMATION PRODUCTS AND TRAINING MATERIALS.

In partnership with the RCMP, CMHC is developing materials to promote the principles of crime prevention through environmental design (CPTED). Priorities were identified at a stakeholder forum held in the Spring of '97. Materials include case studies of success stories at the subdivision and community level, and the enhancement and adaptation of training materials for a variety of distinct audiences, including builders and developers. The advisory document is expected to be available in the Spring of 1999.

CMHC Project Officer: Mark Holtzman

CIDN: 1938 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

DISCRIMINATION IN HOUSING

HOUSING AND DISCRIMINATION: A REVIEW OF CURRENT KNOWLEDGE.

The objective of this research is to identify and examine what knowledge and expertise regarding housing-related discrimination is available in or applicable to Canada.

CMHC Project Officer: Teresa Van Den Boogaard

CIDN: 1792 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSING AND DISCRIMINATION: THE LEGAL FRAMEWORK.

The purpose of this project is to examine housing-related discrimination from a legal perspective to understand how housing-related discrimination fits in Canada's legal framework.

CMHC Project Officer: Teresa Van Den Boogaard

CIDN: 1793 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOME OWNERSHIP

METHODS USED ABROAD TO SUPPORT ACCESS TO HOME OWNERSHIP.

The objective of this research is to investigate significant and novel mechanisms which other nations have employed, encouraged and/or are considering that support and facilitate access to home ownership in general or to target populations. The intent is to identify new mechanisms that might be implemented in Canada that hold promise to improve access to home ownership. The review will cover the U.S., U.K., Germany, France, Australia and New Zealand. The research is being managed under the direction of an advisory committee composed of representatives from the Canadian Home Builder's Association, a Vice President of a major Canadian bank, the Mortgage Insurance Fund, CMHC's Market Analysis Centre and Research Division. This project will be of interest to the construction and renovation industry, the real estate sales sector, mortgage lenders and insurers as well as federal and provincial housing policy analysts.

CMHC Project Officer: David Metzak

CIDN: 1931 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BEST PRACTICES ADDRESSING HOMELESSNESS: DOCUMENTATION.

This project will document a cross-section of 6 to 10 projects that have successfully addressed the needs of the Canadian homeless population. Best practices will represent the range of approaches to homelessness across Canada and will reflect the regions of the country, the variety of initiative types (e.g., emergency shelters, rooming houses, shelter and service support) and populations served (e.g., youth, single women, single men, and families).

CMHC Project Officer: Tom Kerwin

CIDN: 1978 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CHRONIC HOMELESSNESS AMONG WOMEN: A DECADE OF CHANGING NEEDS AND SERVICES.

The objective of this project is to undertake a retrospective review of the changing patterns of women's homelessness in the Toronto area with a focus on chronically homeless women and innovative services, based on the observations and expertise of those who have worked closely with homeless women over the past decade.

CMHC Project Officer: Brenda Baxter

CIDN: 2000 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Sylvia Novac
593A Melita Crescent
Toronto, Ontario
M6G 3Y7

AVAILABILITY: Publication not yet available

ROUNDTABLES ON BEST PRACTICES ADDRESSING HOMELESSNESS.

CMHC will co-host five regional roundtables in early 1999 and a national roundtable in May or June 1999 on best practices addressing homelessness, using the "Best Practices Addressing Homelessness: Documentation" as a basis for discussion. Roundtables will allow opportunities for network building and exchange of information on effective best practices.

CMHC Project Officer: Tom Kerwin

CIDN: 2064 0200

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOMELESSNESS

SERVICES FOR CHILDREN AND YOUTH IN CANADIAN SHELTERS FOR HOMELESS FAMILIES.

This project will investigate space allocations and services for youth and children available in emergency family shelters (i.e., family units in homeless shelters, temporary and satellite shelters such as hotels, and shelters for victims of family violence).

CMHC Project Officer: Tom Kerwin

CIDN: 2085 0200

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSING

HOUSING AND POPULATION HEALTH.

This research project will explore the links between housing and population health. Population health is a way of conceptualizing and acting on health, by focusing on why some groups in society are more prone to illness than other groups. This study will look at the extent to which housing is or may be a factor. The study will commence with a comprehensive and critical review of the literature. This will be followed by an assessment of the evidence to date and the potential for evidence in the future, with an emphasis on the methodological and measurement issues. The project will conclude with a set of ideas for future research directions.

CMHC Project Officer: Philip Deacon

CIDN: 1926 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RESIDENTIAL PROJECTS AND ROAD SAFETY.

The objective of this research is to make an inventory of the proposed residential development principles in view of ensuring the safety of the different road users and the quality of life of residents.

CMHC Project Officer: Leigh Howell

CIDN: 0925 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Denise Piché, Université Laval
School of Architecture
Québec, Québec
G1K 7P4

AVAILABILITY: Publication not yet available

HOUSING AFFORDABILITY

"AFFORDABLE PROJECT OF THE MONTH" WEB PAGE.

This project determined the feasibility, content and method of maintaining a monthly page on the CMHC web site that portrays successful, affordable housing projects. It examined the interests of the development community, especially the non-profit sector, with regard to information on affordability, generated a structure and format that responds to their needs and created an initial database of appropriate projects that could be posted. Six projects that were selected for posting are currently being written up and formatted for the web site. The Web page is expected to be operational by January 1999.

CMHC Project Officer: Fanis Grammenos

CIDN: 1878 0200001

Division: Research Division

STATUS: Ongoing Project

AFFORDABLE HOUSING INITIATIVES FROM THE CANADIAN NON-PROFIT HOUSING SECTOR.

The objective of this project is to document innovative approaches and "best practices" for creating affordable housing from the Canadian non-profit and municipal housing sector and to disseminate this information throughout the housing sector.

CMHC Project Officer: Fanis Grammenos

CIDN: 1794 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

AFFORDABLE, VERSATILE HOUSING.

This project identifies and describes house designs that enable a house to accommodate a range of household types, sizes and needs by means of their adaptability. It documents the features of designs that have been built and it explains their economic and use advantages. The set of designs to be included will cover all housing forms, from detached houses to apartments. This first guide on adaptable designs will be made available both in hard copy and electronic format via the Internet. Publication is expected in the Spring of 1999.

CMHC Project Officer: Fanis Grammenos

CIDN: 1783 0300001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

ALTERNATE TENURE ARRANGEMENTS.

The project has two broad objectives: (1) to develop an up-to-date consolidated source of information on the range of alternate tenure arrangements that can be used to implement affordable housing through partnerships; (2) to assess the extent to which projects utilizing alternate tenure arrangements have successfully met client needs, preferences and expectations. It is intended to be of interest to municipal and provincial officials, and not-for-profit and community groups. Work on the project will include a review of the types of alternate tenure arrangements that exist in Canada, as well as a more focused examination of specific Canadian alternate tenure arrangement projects.

CMHC Project Officer: David Scherlowski

Division: Research Division

STATUS: Planned

AVAILABILITY: Publication not yet available

BACKGROUND RESEARCH ON PHILANTHROPIC SUPPORT FOR AFFORDABLE HOUSING.

The recent Part IX research project entitled "The Role of Public-Private Partnerships (PPPs) in Producing Affordable Housing: Assessment of the U.S. Experience and Lessons for Canada" noted that philanthropies "... have been a critical participant in the development of the PPP affordable housing system in the U.S...." The project will address the considerable information gap with respect to the role that philanthropic support has played and could potentially play in the provision of affordable housing in Canada. The project will provide organizations involved in either creating or supporting the creation of affordable housing through PPPs with an understanding of the opportunities, as well as alternative ways and means of obtaining financial support from the gamut of potential donor sources in the philanthropic sector. The research is being managed under the direction of an advisory committee that includes members from the Canadian Housing Renewal Association's Board, the CCPPPH National Advisory Committee, a former Director of the Canadian Centre for Philanthropy, CMHC national office and field staff from the CCPPPH as well as Research Division.

CMHC Project Officer: David Metzak

CIDN: 2073 200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

BLENDED INCOME HOUSING: LITERATURE REVIEW AND ANALYSIS.

The purpose of this project is to provide a summary of the range of housing, social and economic issues and thinking on income blended housing projects. It is a jointly funded CMHC-Revenue Canada initiative. An advisory committee composed of officials from both organizations is to oversee the conduct of the project. The final report will be of interest to third sector housing providers and homebuilders, as well as municipal and provincial officials. The first phase of the project will focus on the development of an analytical framework and will be used in the review of literature on blended income housing. Literature from Canada, the United States, Britain and other western industrialized countries will be reviewed in the second phase. Findings from the second phase will be analyzed so a comprehensive picture of the range of issues on income blending in housing projects can be presented.

CMHC Project Officer: David Scherlowski

CIDN: 1925 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

GUIDE TO AFFORDABLE HOUSING PARTNERSHIPS.

The purpose of this project is to prepare the content of a guide to creating affordable housing partnerships in Canada. The guide is intended to be used by individuals and organizations in the non-profit, public and private sectors who have an interest in providing affordable housing for families, single persons, seniors and people with disabilities. The publication will be of most use to organizations with less experience in partnering approaches to the provision of affordable housing. The guide is presently being prepared for publication and should be available during the first quarter of 1999.

CMHC Project Officer: Steve Mennill

CIDN: 1874 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

MARKET ANALYSIS AFFORDABILITY SOFTWARE PROJECT.

The objective of this project is to make modifications to Affordability to keep the software current with the latest technology; provide customization for interested clients/partners; create a fully functional Internet version should it be feasible; and provide technical support and expertise to help solve issues and problems that cannot be resolved by CMHC's help desk.

CMHC Project Officer: Greg Goy

CIDN: 1536 1000002

Division: Market Analysis Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

MUNICIPAL REGULATION, LAND USE PLANNING AND FINANCIAL MEASURES FOR NEW AFFORDABLE HOUSING PRODUCTION.

The overall objective of this project is to raise awareness, primarily among planners, of the range of alternative regulatory (inclusionary zoning, density bonusing, alternative development standards), land use planning (performance based planning) and financial measures (exaction programs) that can be used by municipalities during the development approval process to implement new affordable housing. It is intended to identify and describe the range of alternative regulatory, land use planning and financial measures that can be used by municipalities to create new affordable housing. It is also intended to review initiatives that have been undertaken to implement affordable housing. This will be a study at the conceptual level of how the various measures interact and how they could be used together to encourage the creation of new affordable housing. In addition to being of benefit to planners, the project is expected to benefit homebuilders, land developers, third sector housing providers, as well as municipal finance officials.

CMHC Project Officer: David Scherlowski

CIDN: 2080 0200

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

MUNICIPAL REGULATORY INITIATIVES: PROVIDING FOR AFFORDABLE HOUSING.

This study examines regulatory initiatives - namely inclusionary zoning, "linkage" or other development fees, and density bonusing - associated with the development approval process that have been used to provide for housing affordable to lower-income households. The findings are presented primarily through detailed profiles of the activities of two dozen municipalities that have the most representative, productive or other relevant housing programs in the U.S. and Canada. These profiles reviewed the main regulations used in each of these programs, and their overall achievements to date. The report is expected to be of interest to planners, third sector housing providers and builders.

CMHC Project Officer: David Scherlowski

CIDN: 1670 0200002

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

THE NATURE, APPLICABILITY AND POTENTIAL OF HOUSING TRUST FUNDS IN CANADA

The objective of this project is to examine the nature and applicability of housing trust funds and the potential to establish them in Canada for the purpose of funding affordable housing development. The beneficiaries of this work will be municipal and provincial policy analysts, and finance officers, as well as non-profit and social housing providers.

CMHC Project Officer: David Scherlowski

CIDN: 2071 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

THE ROLE OF PUBLIC-PRIVATE PARTNERSHIPS IN PRODUCING AFFORDABLE HOUSING: ASSESSMENT OF THE U.S. EXPERIENCE AND LESSONS FOR CANADA.

In order to strengthen and broaden current efforts to initiate affordable housing public-private partnerships (PPPs) in Canada, research was undertaken to examine the U.S. experience with public-private partnerships. The research found that the U.S. approach to partnerships is "system-wide" - it encourages widespread participation from corporations, philanthropies, foundations, lenders, financial investors, and the non-profit sector in producing affordable rental and home ownership housing. The report outlines a range of initiatives and mechanisms that have evolved in the U.S. that work together to lever limited public-sector funds to produce affordable housing. The U.S. system works to reduce mortgage debt costs so that carrying costs are affordable and the housing is financially viable without the need for ongoing subsidy assistance. This report will be of interest to Canadian housing authorities, non-profit agencies and government housing policy makers interested in learning of alternative measures that could be used to support the provision of affordable housing in Canada.

CMHC Project Officer: David Metzak

CIDN: 1790 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSING AFFORDABILITY

SHELTER AFFORDABILITY AND HOUSING NEEDS: A STUDY OF WINNIPEG FOOD BANK USERS: FINAL REPORT

The purpose of this study was to examine the phenomenon associated with increased use of food banks in Manitoba and to develop a profile of the typical food bank user with respect to shelter needs and other sociodemographic variables. Specifically, the study sought to develop a research instrument and interview methodology that would address the unique sampling difficulties encountered when surveying this group and accurately assess the housing needs of local food bank users relating to shelter affordability, adequacy, and suitability. A random sample of 1,019 food bank users, stratified proportionally across 34 Winnipeg agencies, was used to answer questions regarding financial status, housing conditions and satisfactions, food bank usage, employment history, health and perceptions of prospects for the future and other sociodemographic information.

There was 582 men and 433 women who participated in face-to-face interviews during the winter of 1993-94. Results of this study showed that over 75 percent of the respondents in this study were receiving social assistance. The majority of the food bank users were young, single, employable males on welfare living in rented accommodations that consumed well over 50 percent of their monthly income.

The housing situations of all of the respondents were examined using the affordability, suitability and adequacy indicators from Canada Mortgage and Housing Corporation's core housing need model. Survey results on income and affordability issues indicated that food bank users do not have sufficient income to exist without some form of supplementary aid. Although shelter costs were low in terms of absolute dollar amounts, once shelter costs were subtracted from the food bank user's monthly income, there was very little left to obtain the basic requirements for existence. In other words, the majority of food banks users were shelter poor. While housing conditions were modest, they were reported satisfactory for the most part. Despite this high rate of general satisfaction with housing and neighbourhood, 25 percent of the respondents reported a lack of space and 20 percent reported housing in need of major repair.

Sub-populations selected for additional analysis included: welfare recipients; single parent families; families without children; single male, and single female households; households with seniors and persons with disabilities. Content analysis was performed on open-ended responses and on written observations made by interviewers during the interviews.

Data from the survey were combined with Statistics Canada 1991 Census data aggregated across forward sortation areas (FSAs) for 18 Winnipeg neighbourhoods. Results indicate a strong relationship between the socioeconomic status of a neighbourhood and the amount of food bank activity. Neighbourhoods in the core area, specifically R2W, R3B and R3C had the strongest relationship between low socioeconomic status and high food bank use.

The findings hold implications for the remaking of housing policy and social welfare policy in Canada.

Prepared by: Jeff A. Sloan and Dana G. Stewart. CMHC Project Officer: John Engeland. Ottawa: Canada Mortgage and Housing Corporation, 1997 (External Research Program)

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

HOUSING AND IMMIGRATION

IMMIGRANTS' GUIDE TO CANADIAN HOUSING.

The purpose of this project is to produce a guide that will assist immigrants in understanding Canadian housing and housing systems. The guide will include general information on Canadian housing as well as detailed information on how to obtain rental housing and how to buy a home. It will also provide information on contacts including government agencies and immigrant aid organizations. The substantive content for the guide is almost complete and publication is expected in mid-1999.

CMHC Project Officer: Steve Mennill

CIDN: 1802 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSING EXPORT OPPORTUNITIES

ADAPTING CANADIAN HOUSING TO INTERNATIONAL MARKET REQUIREMENTS.

The objectives of this project are to develop a qualitative and quantitative presentation on the extent of off-the-shelf versus adapted offerings of industry at present; develop a sector-by-sector picture of the feasibility of adaptation, based on considerations to be taken into account in each, and on specific case studies; and, develop a ranked list of practical steps which can be taken by Canadian industry to adapt to foreign customer requirements and expectations. Publication will be available early in 1999.

CMHC Project Officer: Rob Duncan

CIDN: 2008 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: David Crenna
82 Bayswater Avenue
Ottawa, Ontario, K1Y 2E9

AVAILABILITY: Publication not yet available

ATTENDANCE AND REPORT ON THE ENERGY EFFICIENT RETROFITTING OPPORTUNITIES IN RUSSIA - BUSINESS BRIEFING.

The objective of this project is to attend, monitor, network and report on the Business Briefing concerning the Energy Efficient Retrofitting Opportunities in Russia to take place at the University of South California on Thursday, July 9/98.

CMHC Project Officer: Jeremy Melhuish

CIDN: 2057 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSING EXPORT OPPORTUNITIES

CANADIAN/JAPANESE CONSTRUCTION COST ANALYSIS OF A TYPICAL 2X4 FRAMED HOUSE PLAN.

The purpose of this project is to develop a costing spreadsheet tool for use on all soft and hard costs forming part of the delivered turn key project including at minimum, design; permits and approvals; materials; etc.

CMHC Project Officer: Jay Thakar

CIDN: 1596 0900001

Division: Canadian Housing Export Centre

STATUS: Completed

AVAILABILITY: Publication not yet available

CRITERIA TO HELP FORGE SUCCESSFUL CANADIAN HOUSING ALLIANCES.

The purpose of this project is to develop and validate criteria to help determine what makes alliances successful in the housing export market.

CMHC Project Officer: Louis Musto

CIDN: 1770 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

EVALUATION OF CODES, REGULATIONS, DESIGN & BUILDING METHODS IN PRIORITY MARKETS (USA, RUSSIA, SOUTH KOREA, CHILE).

Canadian exporters of pre-packaged housing and components can compete in off shore markets if they can understand and access their market. Exporters must negotiate foreign markets, regulatory systems and familiarize themselves with local design practices and construction technologies, interpret the local vernacular and housing preferences and then market and distribute their product. The first step in managing these obstacles is to fully understand them so that strategies can be developed to overcome them. Some of this information has already been researched or is in the process of being researched by CMHC and other agencies such as DFAIT, NRCan and NRC. In other cases, especially in emerging markets, little information is available to guide exporters.

CMHC Project Officer: Rob Duncan

CIDN: 1949 0200002 (USA),
1949 0200003 (Russia),
1949 0200004 (South Korea),
1949 0200005 (Chile)

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publications not yet available

EXPORT HOME SEISMIC SLAB FOUNDATION.

The purpose of this project is to identify and develop a new seismic resistive foundation system for use in Japan, which could be "packaged" with Canada's housing technology and exports to create a value-added and thus more attractive export housing product.

CMHC Project Officer: Rob Duncan

CIDN: 2019 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Ian B. Bazley
32 Bello Road
Kelowna, British Columbia V1V 1C1

AVAILABILITY: Publication not yet available

EXPORT PERFORMANCE AND NEEDS OF THE CANADIAN MANUFACTURED HOUSING INDUSTRY.

The objective of this research is to develop a statistical profile and to identify the export performance and needs of the Canadian manufactured housing industry.

CMHC Project Officer: Louis Musto

CIDN: 1909 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

FEASIBILITY STUDY ON AFTER-SALES SERVICES AND ESTABLISHMENT OF A WAREHOUSE FOR CANADIAN HOUSING EXPORTS IN JAPAN.

The objectives of this project are to identify existing programs for after-sales services; to provide options for after-sales services; to study Japanese laws and regulations governing the establishment of a warehousing facility in Japan by a foreign company; and to do a cost-benefit analysis for the recommended option.

CMHC Project Officer: Jay Thakar

CIDN: 2056 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INTERNATIONALIZATION OF CANADIAN HOUSING SECTOR BUSINESSES: A PERCEPTUAL ANALYSIS.

The objective of this project is to conduct directed interviews with forty business executives throughout the country, working in three sub-sectors of the housing industry: professional construction services, housing manufacturers and product and material makers.

CMHC Project Officer: Joanne Hallée

CIDN: 1999 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: François Cadotte, FC Recherche
2238 Belgrave Avenue
Montreal, Québec H4A 2L8

AVAILABILITY: Publication not yet available

HOUSING EXPORT OPPORTUNITIES

OPPORTUNITIES FOR CANADIAN FACTORY BUILT HOUSING IN THE SOUTHEASTERN UNITED STATES.

The purpose of this project is to identify the opportunities and impediments to the penetration of Canadian factory built housing in the southeastern United States.

CMHC Project Officer: Louis Musto

CIDN: 1953 0900002

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RETROFITTING RUSSIA'S HOUSING STOCK: OPPORTUNITIES AND OBSTACLES FOR CANADIAN EXPORTERS.

The purpose of this project is to identify several basic business development strategies which could be employed by Canadian firms to practically and realistically respond to the market opportunities represented by the Russian housing sector.

CMHC Project Officer: Oliver Drerup

CIDN: 1830 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SEMINAR CURRICULUM ON THE CANADIAN HOUSING SYSTEM AND THE ESTABLISHMENT OF AN INTERNATIONAL TRAINING TEAM.

The objective of this project is to develop a seminar curriculum on the Canadian housing system to establish an international training team.

CMHC Project Officer: Louis Musto

CIDN: 1973 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SUSTAINABLE DEVELOPMENT IN CANADA.

The objective of this project is to investigate the application of Canadian sustainable development in the Japanese market.

CMHC Project Officer: Jay Thakar

CIDN: 2092 0900001

Division: Canadian Housing Export Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSING MARKET

EMPLOYMENT AND HOUSING ACTIVITY: A CYCLICAL ANALYSIS.

The objective of this project is to review the economic literature, prepare an estimation strategy, analyze the past cycles of retained employment indicators and estimate the elasticities of housing starts and MLS sales in relation to the employment indicators.

CMHC Project Officer: Louis Trotter

CIDN: 1952 1000002

Division: Market Analysis Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSING SURVEYS

FIVE PILOT SURVEYS OF CONSUMER INTENTIONS TO BUY OR RENOVATE.

The objective of this project is to undertake and complete five pilot surveys of Consumer Intentions to Buy or Renovate.

CMHC Project Officer: Greg Goy

CIDN: 1587 1000003

Division: Market Analysis Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSING INTENTIONS SURVEYS OTTAWA-CARLETON, 1998

The Corporate Research Group Ltd. was commissioned by the Canada Mortgage and Housing Corporation (CMHC) to conduct surveys with owner and renter households in Ottawa-Carleton.

The objective of the surveys was to identify "Housing Intentions" of a cross section of owner and renter households, in the Ottawa-Carleton Region. More specifically, to gauge future housing plans of local residents and to obtain a variety of housing and economic related information including respondents expectations for the coming year.

All surveys were conducted by telephone, using trained bilingual staff, during November 1998, and from the Nepean offices of the Corporate Research Group Ltd. Renter households participating in the survey were selected at random. Owner households consisted exclusively of those attempting to sell their homes and were identified using various means.

The main highlights of the survey, a copy of the survey instruments, the detailed findings and the statistical tables and graphs are presented. A summary of the survey results was delivered during CMHC's Housing Outlook Conference, held in Ottawa, Monday November 30, 1998.

Prepared by The Corporate Research Group Ltd. Prepared for Canada Mortgage and Housing Corporation. CMHC Project Officer: Novak Jankovic. Ottawa: CMHC, 1998.

**** Price:** \$50.00 + GST and handling charges

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

HOUSING SURVEYS

REVIEW OF DATA SOURCES AND INDICATORS.

The purpose of this project is to undertake a review of the major national data sources that include housing information which will assist in examining the role each might play in monitoring housing and community trends and developing related indicators.

CMHC Project Officer: Roger Lewis

CIDN: 1988 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

SEASONAL ADJUSTMENT OF HOUSING STARTS TIME SERIES.

The objective of this project is to introduce reliable estimates of seasonally adjusted series at the beginning of the new year, at the time when all other CMHC survey data are revised and updated.

CMHC Project Officer: Michel Laurence

CIDN: 1967 1000002

Division: Market Analysis Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

INFRASTRUCTURE

ALTERNATIVE METHODS OF FINANCING MUNICIPAL INFRASTRUCTURE.

This paper is the first in a series of three CMHC studies looking at infrastructure finance. The paper looks at the evolution of the issues, the challenges confronting municipalities, and different financing methods. The second and third papers in this series explore in more detail the potential for public-private partnerships, and demand-side management to fund the provision, operation and maintenance of municipal infrastructure. The papers will be available in April 1999.

CMHC Project Officer: David D'Amour

Division: Research Division

STATUS: Ongoing project

AVAILABILITY: Publication not yet available

PROVISION OF MUNICIPAL INFRASTRUCTURE THROUGH DEMAND MANAGEMENT: GUIDEBOOK AND CASE STUDIES

This paper is the second in a series of three CMHC studies looking at infrastructure finance. The paper looks at the ability of Demand Management (DM) measures to contribute to meeting future water and wastewater infrastructure demands. It will be available in April 1999.

CMHC Project Officer: David D'Amour

CIDN: 1916 0200001

Division: Research Division

STATUS: Ongoing project

AVAILABILITY: Publication not yet available

INFRASTRUCTURE

PUBLIC-PRIVATE PARTNERSHIPS IN MUNICIPAL INFRASTRUCTURE.

This paper is the third in a series of three CMHC studies looking at infrastructure finance. The paper explores the potential for public-private partnerships to fund the provision, operation and maintenance of municipal infrastructure. It will be available in April 1999.

CMHC Project Officer: David D'Amour

CIDN: 1788 0200001

Division: Research Division

STATUS: Ongoing project

AVAILABILITY: Publication not yet available

MORTGAGES AND HOUSING FINANCE

EXAMINATION OF THE PROSPECTS FOR, AND POTENTIAL IMPACTS OF REAL ESTATE INVESTMENT TRUSTS ON THE MULTI-FAMILY RENTAL MARKET IN CANADA.

A Real Estate Investment Trust (REIT) is a tax advantaged investment vehicle set up to own and manage real estate. REITs raise money through publicly listed partnership units (Canada) or through shares (U.S.).

REITs have shown phenomenal growth in the U.S. in recent years. REITs focusing on residential apartments in the U.S. now hold a total of around 1 million rental units. The Canadian REIT industry is very small in comparison. The first two Canadian REITs focusing on residential apartment properties were formed in 1997.

The purpose of this paper is to explore whether the U.S. pattern of REIT growth is likely to be followed in Canada and to assess whether REITs represent a financing mechanism which can improve rental affordability and the financial viability of regenerating or constructing residential rental units in Canada.

The report concludes that use of the REIT structure in the U.S. has enabled real estate operators and developers to achieve greater access to capital, and lower cost financing for acquisition, construction and renovation. The resulting ability to grow has also enabled them to achieve economies of scale in purchasing, marketing and operations.

The lower costs and greater availability of capital has reduced cost pressure on rents for existing owners and enabled projects (including renovation) to go ahead, thereby increasing supply and further moderating pressure on market rents.

REITs could assist in revitalizing the Canadian rental sector by drawing additional players and a new source of funding into the market, and contributing to upgrading the stock particularly in areas where renovation has been discouraged through rent controls.

The potential for REITs in Canada, however, is limited by legislative and regulatory factors. In addition, a number of market and economic factors are not as conducive to REITs obtaining the competitive advantages that they enjoy in the U.S.

Prepared by Tony Wellman. CMHC Project Officer: David Metzek. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road, Ottawa, Ontario, K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
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Email: chic@cmhc-schl.gc.ca
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FEASIBILITY STUDY ON THE COMMERCIAL VIABILITY OF LAND-ONLY MORTGAGE LOAN INSURANCE.

Canada Mortgage and Housing Corporation (CMHC) is interested in assessing the commercial viability of land-only mortgage loan insurance, which is generally not available in the marketplace today. Land-only mortgage loan insurance is defined as insurance protection to obtain financing to acquire and/or service land for housing related purposes.

The purpose of this study was to enable CMHC to better assess the potential demand for land-only mortgage loan insurance, the risk to CMHC in offering land-only mortgage insurance and what means are available to CMHC to mitigate associated risks.

Through questionnaires and face-to-face interviews, data was collected to permit the analysis of the critical success and failure factors and to identify financing gaps in the land development process. This information set the framework within which the insurance parameters were subsequently developed. Specific areas within two provinces were selected for analysis: one where there is a high degree of housing market activity and where land prices can be volatile (The Greater Toronto Area of Ontario) and one with a relatively stable housing market activity (the Winnipeg Region of Manitoba).

Ottawa: Canada Mortgage and Housing Corporation, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
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Tel.: 613-748-2367 or 1-800-668-2642
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MANAGING THE RISKS ASSOCIATED WITH A REVERSE EQUITY MORTGAGE (REM) LOAN INSURANCE PORTFOLIO.

The purpose of this project is to complete a study on the management of risks associated with an insured reverse equity mortgage (REM) portfolio.

CMHC Project Officer: Brian Davidson

CIDN: 1728 0100002

Division: Strategic Planning, Policy & Marketing

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

MORTGAGE AND INTEREST RATES MODELING AND FORECASTING.

The purpose of this research is to review and evaluate current approaches and practices to modeling and forecasting mortgage and interest rates, and to construct a set of models to provide CMHC with accurate forecasts of these rates.

CMHC Project Officer: Ali Manouchehri

CIDN: 1858 1000001

Division: Market Analysis Centre

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PERSONAL FINANCIAL MANAGEMENT FOR HOME OWNERSHIP IN TRANSITIONAL SOCIETIES.

The objective of this project is to contribute to the efficiency of the mortgage credit and housing markets of Visegard countries by evaluating the situation which has evolved since 1989 and by making recommendations on what might be done to improve the working of those markets. The project will enable the Canadian housing and financial industries to understand the challenges and opportunities confronting them when dealing with the Visegard markets.

CMHC Project Officer: Doug Dennis

CIDN: 1997 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Professor John L. Pratschke
Department of Consumer Studies
University of Guelph
Guelph, Ontario N1G 2W1

AVAILABILITY: Publication not yet available

PERSONS WITH DISABILITIES

ACCESSIBLE DOWNTOWN RESIDENTIAL COMMUNITIES: A CASE STUDY OF WINNIPEG, MANITOBA.

The purpose of this project is to examine housing and community design needs of persons with disabilities, including the elderly, to determine how these needs could be met in a downtown residential location as part of the revitalization of a downtown area.

CMHC Project Officer: Tom Parker

CIDN: 2017 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Nancy Klos, Institute of Urban Studies
University of Winnipeg, 346 Portage Avenue
Winnipeg, Manitoba R3C 0C3

AVAILABILITY: Publication not yet available

HOUSING NEEDS OF PEOPLE WITH DISABILITIES.

The objective of this project is to provide a profile of the housing characteristics and needs of people with disabilities using data from the 1991 Census and post-censal Health and Activity Limitations Survey (HALS).

CMHC Project Officer: Jamie Angus

CIDN: 1045 0200003

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PERSONS WITH DISABILITIES

MAJOR MAINTENANCE AND RESIDENTIAL RENOVATION: A SURVEY OF MEANS TO IMPROVE THE ARCHITECTURAL ACCESSIBILITY OF EXISTING BUILDINGS.

The objective of this project is to study the extent to which it is possible to integrate architectural accessibility into existing residential buildings during major maintenance or common renovation work planned by an owner.

CMHC Project Officer: Sophie Bang, Succursale de Montreal

CIDN: 2021 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Sophie Lanctôt, c/o Société Logique Inc.
3250, boul. St-Joseph Est
Montréal, Quebec H1Y 3G2

AVAILABILITY: Publication not yet available

NARRATIVES ON DEDICATED MIXED AND INTEGRATED HOUSING.

It is widely acknowledged that the key components of any comprehensive community support and rehabilitative approach for consumers of psychiatric services include decent, stable housing and the availability of a wide variety of supports. There has been growing evidence that mental health consumers' perceptions of what they need in a living environment are the best predictors of success in housing. The objective of this study was to examine mental health consumer and mental health provider preferences for and perceptions of three housing types: dedicated, mixed and integrated housing. Forty-five interviews were conducted with consumers of mental health services living in each of the three types of housing and 24 interviews were conducted with mental health providers.

The results of this study indicate that mental health consumers have varied needs and preferences for housing and that the availability of a wide range of housing choices is important to both mental health consumers and service providers.

Prepared by: K.M. Boydell, B.M. Gladstone, E.K. Crawford, J. Trainor. CMHC Project Officer: Luis Rodriguez. Ottawa: Canada Mortgage and Housing Corporation, 1998 (CMHC External Research Program).

STATUS: Completed Report

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Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

PERSONS WITH DISABILITIES

AN OUTLOOK ON MENTAL HEALTH CONSUMERS HOUSING NEEDS.

The objective of this research is to examine the supportive housing needs of the severely chronically mentally ill in the Manitoulin-Sudbury District by location and by language, culture and gender.

CMHC Project Officer: Teresa van den Boogaard

CIDN: 1852 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Geneviève Gibbons, Canadian Mental Health Association
111 Elm Street
Sudbury, Ontario, P3C 1T3

AVAILABILITY: Publication not yet available

SPACE EFFICIENT UNIVERSAL DESIGN INNOVATIONS.

The objective of this project is to evaluate design innovations which have been developed specifically to enhance access for people who use wheelchairs.

CMHC Project Officer: Tom Parker

CIDN: 2009 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Gloria Gutman
Gerontology Research Centre, Simon Fraser University
2800-515 West Hastings Street
Vancouver, British Columbia V6B 5K3

AVAILABILITY: Publication not yet available

PROPERTY MANAGEMENT

CURRENT CONDITIONS IN THE RESIDENTIAL PROPERTY MANAGEMENT INDUSTRY.

This project is intended to result in a profile of the residential property management industry. It will contain statistical and descriptive information on the size and concentration of the industry, the roles and responsibilities of the key players, and any available data on how the industry is positioned internationally. It is intended to focus on a number of social and economic topics associated with residential property management. Results of the project will determine the nature and depth of associated information gaps and research needs. The project will be of interest to residential property managers.

CMHC Project Officer: David Scherlowski

CIDN: 1966 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

ACT IN ACTION: AFFORDABILITY AND CHOICE TODAY -- LESSONS LEARNED: FINAL REPORT.

Affordability and Choice Today (ACT) is a federally funded program that encourages municipalities and the housing sector to work in partnership to conceive, test and implement changes to the existing web of building and development regulations. The belief is that some change is necessary - even essential - to foster the development of more affordable housing and to widen the range of housing choices. This report looks at a number of projects completed under the program. It identifies elements in each that have led to positive changes. In doing so, it gives decision-makers the information they need to assess, not only the value of alternative approaches, but also their relevance and transferability to their communities.

Prepared by David Bruce. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: David Scherlowski. Ottawa, CMHC, 1998.

*Order number: PE0309. ** Price \$12.95 + GST and handling charges.*

STATUS: Completed Report

AVAILABILITY: CMHC Information Products

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Fax orders from Canada 1-800-245-9274

International clients see page 9 for order instructions.

NOTE: Aussi disponible en français sous le titre : *ACT en action: Abordabilité et choix toujours: leçons apprises.*

THE CITY OF YELLOWKNIFE DEVELOPMENT APPROVAL PROCESS REVIEW AND STREAMLINING : CASE STUDY. = ÉTUDE ET RATIONALISATION DU PROCESSUS D'APPROBATION DES DEMANDES D'AMÉNAGEMENT DE LA VILLE DE YELLOWKNIFE : ÉTUDE DE CAS.

In 1992, the City of Yellowknife, Northwest Territories, undertook a Development Approval Process Review to find out how well its method of approving and issuing building and development permits was working and where it might be improved.

Having a well-oiled approval process is desirable anywhere but is particularly important in the North. Builders there face a short construction season so delays could force them to work in winter weather or to postpone jobs until the next building season. Either alternative drives up costs and eventually makes housing and commercial space less affordable.

In June 1993, the City hired the Yellowknife consultancy firm of Ferguson, Simek, Clark (FSC) Engineers and Architects to undertake the investigative phase of the project and to make recommendations for improvements. The consultants interviewed Yellowknife civic officials who manage the approvals process, members of the public who used the system, and officials in other municipalities who could describe how their permit approval processes operated.

In general, the consultants found that Yellowknife's system worked well. When applicants understood the process - mostly because they were old hands at obtaining approvals - there were few problems. When problems occurred, it was usually due to a lack of information. Those interviewed felt it was imperative that the City publish information to help users understand how the approval process operates and what is required of them. Those interviewed also advocated various measures to improve efficiency.

As a result of the Development Approval Process Review and a coincidental amendment to its building by-law, the City of Yellowknife implemented several reforms to its permit approval process. First and foremost was the publication of six brochures that guide applicants through the approval process. Four of these brochures relate to specific types of construction while the other two are general guides to obtaining building permits and mechanical permits.

The City also eliminated the need for building permits for several types of small-scale projects and introduced administrative efficiencies. A review of the zoning by-law, still underway when this report was written in 1997, may generate additional reforms.

Affordability and Choice Today (A.C.T.) Streamlined Approval Process Project / Department of Planning and Lands, City of Yellowknife, N.W.T. Prepared by Word-Works Communications Services. Prepared for: Federation of Canadian Municipalities, Canadian Home Builders' Association, Canadian Housing and Renewal Association, Canada Mortgage and Housing Corporation. Ottawa. The Federation; The Associations, CMHC, 1997.

STATUS: Completed Report

AVAILABILITY: Canadian Housing information Centre
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700 Montreal Road
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K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
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NOTE: Bilingual/bilingue.

HOW THE REGIONAL MUNICIPALITY OF HAMILTON-WENTWORTH STREAMLINED ITS DEVELOPMENT APPROVAL PROCESS: CASE STUDY = MUNICIPALITÉ RÉGIONALE DE HAMILTON-WENTWORTH, PROCESSUS D'APPROBATION DES DEMANDES D'AMÉNAGEMENT: PROJET DE RATIONALISATION DU PROCESSUS : ÉTUDES DE CAS.

Between 1994 and 1997, the Regional Municipality of Hamilton-Wentworth (RMHW) in Ontario streamlined its development approval process. It slashed red tape, reduced obstacles to growth, adopted innovative measures to resolve disputes over land use and took measures to stimulate the construction of innovative and affordable housing.

The project had these key objectives:

- eliminate procedural bottlenecks
- reduce or eliminate duplication through better cooperation and coordination among Regional departments
- fast-track innovative and/or affordable housing initiatives
- establish a mediation process at the regional level as a means of alternative dispute resolution

REGULATORY REFORM

- extend the Region's streamlined methodology to the lower tier municipalities within the region.

The reformed RMHW development approval process features:

1. Adherence to established time frames for approvals.
2. A checklist built into each type of application form to ensure applications arrive complete.
3. Pre-consultation meetings to identify potential problems upfront with development proposals so that issues can be addressed early in the process.
4. A Regional Mediation office that offers alternative dispute resolution services when they are needed.
5. Regional planners and engineers dealing with subdivision plans are working in the same division.
6. Delegation of some responsibilities to the lower tier municipalities.
7. Expanded authority for Regional staff to approve undisputed applications.

The streamlining projects also produced four publications. One guides applicants through the revamped planning process, another through the standards for engineering submissions, the third encourages innovative housing developments and the fourth stimulates the production of affordable housing.

This reformed development approval process has been implemented across the entire Region, offering a standardized service at both the regional and local levels. Builders and developers in Hamilton-Wentworth now have the advantage of improved service delivery, faster application turnaround times, pre-consultation and checklists to ensure everything is in order. All these improvements translate into lower builder/developer input costs that can be passed on to housing consumers.

Affordability and Choice Today (A.C.T.) Streamlined Approval Process Project / Development Division, Regional Environment Department, Regional Municipality of Hamilton-Wentworth, Ont. Prepared by Word-Works Communications Services. Prepared for: Federation of Canadian Municipalities, Canadian Home Builders' Association, Canadian Housing and Renewal Association, Canada Mortgage and Housing Corporation. Ottawa: The Federation; The Associations, CMHC, 1998.

STATUS: Completed Report

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NOTE: Bilingual/bilingue

1998 ASSESSMENT OF THE AFFORDABILITY AND CHOICE TODAY (ACT) PROGRAM.

The objective of the project is to assess the ACT program to assist CMHC Senior Management in its decision to extend, modify or discontinue the program. It will also recommend future directions for the program to enhance its relevance, success and cost-effectiveness. The study method will involve a hybrid data collection strategy consisting of a review of ACT project files, a fax-out/fax-back survey of 150 key participants in ACT projects as well as 150 industry representatives and municipal officials from non-ACT communities, and 10 structured information interviews with ACT program managers and management committee members. As a follow-up to the formal evaluation undertaken in 1995, the study will determine the success with which the recommendations from that evaluation were implemented.

CMHC Project Officer: Susan Fisher

CIDN: 2059 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PLANNING AN ARTISAN COMMUNITY: CASE STUDY = PLANIFICATION D'UNE COMMUNAUTÉ ARTISANALE : ÉTUDE DE CAS.

In 1994, the City of Sainte-Geneviève, a small municipality located on Montreal's West Island, was awarded an A.C.T. grant to carry out a demonstration project that would encourage the development of affordable, mixed-use artisan accommodation. The project was part of an initiative called *Sainte-Geneviève, Ville artisanale*, aimed at encouraging artisans to establish themselves in the community. The municipality conceived this plan to revitalize its downtown core and stimulate economic growth. With many centrally located buildings vacant, businesses closing and a working population migrating to neighbouring towns, the project was considered critical to the community's survival.

The project involved consultations with local artisans, property owners, and representatives of other municipalities with sizable artisan communities.

The City of Sainte-Geneviève introduced two innovative regulatory changes in order to encourage the development of accommodation that would meet the needs of artisans:

- The Municipal Development Plan was modified to permit artisans to live, work and sell their products from their workshop or residence; and to create artisan districts or zones.
- A Siting and Architectural Integration Plan was adopted that would allow flexibility in applying regulations, while preserving heritage, character and standard of living quality objectives through specialized criteria.

The demonstration building is a converted garage on property owned by a cabinetmaker and his family. The cabinetmaker, in consultation with the project team, added a second floor over the garage adjacent to his heritage home to display and store furniture. The ground floor of the building was converted into a workshop and an office. The building's new façade harmonizes with the City's architectural heritage, providing an attractive example and stimulus for other artisans and property owners. The A.C.T. renovation project fully embodied the City's objectives in establishing mixed-use accommodation for artisans.

Sainte-Geneviève, in encouraging mixed-use accommodation, is reviving a tradition of working artisans that is very much part of the community's heritage. The initiative is also encouraging small business, the primary area of employment growth in Canada, and making home-based businesses an important part of local development.

Affordability and Choice Today (A.C.T.) Demonstration Project. City of Sainte-Geneviève, Sainte Geneviève, Quebec. Prepared by Energy Pathways Inc. Prepared for: Federation of Canadian Municipalities, Canadian Home Builders' Association, Canadian Housing and Renewal Association, Canada Mortgage and Housing Corporation. Ottawa: The Federation; The Associations, CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation
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SHARED OWNERSHIP HOUSING PILOT PROJECT: CASE STUDY = PROPRIÉTÉ PARTAGÉE PROJET PILOTE : ÉTUDE DE CAS

In 1991, the City of Trois-Rivières, Quebec, initiated a strategy to revitalize its older residential neighbourhoods. One of the City's primary aims was to make downtown living more attractive to young families, with a view to reversing the loss of population to the suburbs and urban periphery. Trois-Rivières' centrally located neighbourhoods offer residents many advantages, including proximity to urban amenities such as schools, parks, medical services and the recently developed Old Port.

A non-profit housing organization, Habitations populaires Desjardins du Centre du Québec (HPDCQ), has worked in cooperation with the city of Trois-Rivières on a number of renewal projects. As part of the City's revitalization efforts, HPDCQ decided to use a novel approach to the provision of affordable housing, called "shared ownership". By allowing the home buyer to purchase the building first, and the land several years later, at no interest, shared ownership makes homeownership more accessible and affordable. This is especially true in downtown areas where the high cost of land can discourage the construction of smaller affordable homes suitable for first-time buyers.

In spring 1993, HPDCQ was sponsored by A.C.T. to design and construct two small, semi-detached single-family homes in one of Trois-Rivières' older neighbourhoods, using the shared ownership approach. Municipal regulations currently do not permit the development of this type of small-lot housing. In order to construct the two demonstration homes, modifications to various municipal zoning and land development bylaws were required. In particular, the City amended its zoning bylaw to permit the construction of semi-detached single-family homes on a site previously zoned for multi-family housing. Zoning regulations were also modified to reduce side and rear setbacks, minimum lot size and building size. Furthermore, the land development bylaw was amended in order to subdivide the site into two smaller parcels.

This A.C.T. initiative combined innovative financing with a small-house design suitable for low- and middle-income households. By deferring the payment for the land component of a house for several years, shared ownership reduces the upfront cost of purchasing a home, thereby making homeownership more accessible. Small-home infill projects such as this A.C.T. demonstration project not only make more effective use of land in built-up areas, they also increase housing choice in downtown neighbourhoods.

Due to the success of the pilot project, HPDCQ plans to build more affordable shared-ownership housing on a site owned by the City of Trois-Rivières. Other Canadian municipalities can benefit from the lessons learned from this A.C.T. project.

Affordability and Choice Today (A.C.T.) Demonstration Project / Habitations populaires Desjardins du Centre du Québec, Trois-Rivières, Québec. Prepared by Julie Tasker-Brown. Prepared for: Federation of Canadian Municipalities, Canadian Home Builders' Association, Canadian Housing and Renewal Association, Canada Mortgage and Housing Corporation. Ottawa: The Federation; The Associations, CMHC, 1998.

STATUS: Completed Report

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SMALL LOT HOUSING: CASE STUDY = CONSTRUCTION SUR LOTS DE PETITE DIMENSION : ÉTUDE DE CAS

Urban intensification has become an increasingly important strategy for maximizing land use within existing municipal boundaries. By the late 1980s, the City of Charlottetown was giving intensification through small lot infill development careful consideration. As in many other municipalities, urban development in Charlottetown had become very constrained, and lengthy delays in the approval process indicated the City needed to review its zoning and development by-law and investigate intensification options.

The City of Charlottetown was awarded an A.C.T. grant in 1992 to meet its objectives by developing guidelines for infill housing and revising its zoning by-law to accommodate this housing form. One of the key findings of the project was Charlottetown's reliance on variances and re-zoning related to infill development. This reflected a lack of flexibility in the zoning by-law, and unnecessarily complicated and lengthened the approval process.

The project team noted that many municipalities have shifted from relying on rigid requirements to allowing flexible performance standards. A number of municipalities have revised their by-laws to combine fixed requirements with flexible performance standards. The project team advised that community input would be an important factor in establishing practical and acceptable performance criteria. The project team concluded that the City could meet its objectives and achieve flexibility through relatively minor adjustments to, and fine-tuning of, existing regulations. Selected sections of the zoning by-law could be amended, and architectural and site development criteria could be established.

Affordability and Choice Today (A.C.T.) Streamlined Approval Process Project / City of Charlottetown, Charlottetown, P.E.I. Prepared by Energy Pathways Inc. Prepared for: Federation of Canadian Municipalities, Canadian Home Builders' Association, Canadian Housing and Renewal Association, Canada Mortgage and Housing Corporation. Ottawa: The Federation; The Associations, CMHC, 1998.

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International clients see page 9 for order instructions.

NOTE: Bilingual/bilingue.

SUBDIVISION REGULATION: MEETING SMALL-TOWN NEEDS: CASE STUDY = RÉGLEMENTATION DU LOTISSEMENT : RÉPONDRE AUX BESOINS DES PETITES VILLES : ÉTUDE DE CAS

In 1991, the Town of Sackville and the Tantramar Planning District Commission were awarded an A.C.T. grant to undertake a project that would provide a small-town model for subdivision regulation, and that would address environmental concerns with regard to subdivision development.

The project involved four phases, the first being a literature review of subdivision planning approaches and regulations in Canada and the U.S. The next phase involved an assessment of the existing subdivision by-law and approval process, in light of the literature review and with further consultation. The third and fourth phases involved revising and adopting a new subdivision by-law; making changes to and documenting the approval process; preparing a subdivision guidebook for use by planning staff; and compiling engineering standards into a single document.

In adopting the revised Subdivision By-law No. 121, Sackville made significant changes intended to improve land affordability and land use efficiency, and permit a variety of servicing options:

- Subdivisions with private roads were permitted, subject to approval by the Tantramar Planning District Commission.
- Road classifications were defined and width requirements decreased.
- Flag lots were permitted by right.

The project team found the environmental provisions could not be incorporated into the Subdivision By-law due to legislative restrictions. Suggestions regarding environmental features and design guidelines were included in a subdivision guidebook prepared for municipal planning staff, and environmental policies were prepared for consideration in the future review and revision of Sackville's Municipal Plan.

Actions undertaken to streamline the approval process included both changes to the process, and clear documentation of the process. Sackville implemented the A.C.T. project team's recommendation that representatives from both its planning and its engineering departments would attend any initial meeting with a developer.

A lack of clear documentation outlining Sackville's approval process and requirements had contributed to confusion and delays. In order to facilitate understanding, compliance, and speedy approval, the team prepared flowcharts and checklists for use by applicants and staff, and developed two detailed documents:

- *Town of Sackville Standard Municipal Specification* - This consolidates all engineering requirements into a single, comprehensive document.
- *Sackville Subdivision Guidebook* - This outlines the approval process, discusses regulatory requirements, and provides design guidelines related to environmental considerations.

Finally, the project team determined that the terminology of the existing subdivision by-law could be confusing to, and not easily understood by, many readers. The revised Subdivision By-law was written in "plain language," for everyone to understand.

REGULATORY REFORM

Affordability and Choice Today (A.C.T.) Streamlined Approval Process Project / The Town of Sackville and the Tantramar Planning District Commission Sackville, New Brunswick. Prepared by Energy Pathways Inc. Prepared for: Federation of Canadian Municipalities, Canadian Home Builders' Association, Canadian Housing and Renewal Association, Canada Mortgage and Housing Corporation. Ottawa: The Federation; The Associations, CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

NOTE: Bilingual/bilingue.

RENTAL HOUSING

FEASIBILITY OF CREATING A CANADIAN MULTIPLE-UNIT RENTAL HOUSING DATA BASE.

The objective of this project is to assess the feasibility of developing a Canadian multiple-unit rental housing database. To that end, the following four questions will be addressed: (i) Should CMHC initiate the development of a multiple-unit data base? (ii) What opportunities would there be to partner with other organizations? (iii) Should a Canadian initiative be linked in some way with the U.S. effort being managed by the Multifamily Housing Institute? and, (iv) What are the options for proceeding?

CMHC Project Officer: David Scherlowski

CIDN: 2095 0200

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RENTERS AND THEIR HOUSING CONDITIONS: FROM THE 1980s INTO THE 1990s.

The purpose of this project is to examine how and why the circumstance of renter households changed over the last fifteen years, with special focus on housing conditions, and the social and economic factors associated with changes in the level and nature of housing need.

CMHC Project Officer: John Engeland

CIDN: 1582 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RENTAL HOUSING

REVIEW OF METHODS GOVERNMENTS HAVE EMPLOYED TO SUPPORT PRIVATE RENTAL HOUSING.

In the current fiscal environment, the federal and provincial governments have limited resources to use in directly supporting the availability of affordable rental housing and must rely on the private sector to achieve this objective. As part of CMHC's efforts to enhance and broaden the understanding of rental housing, this project examines alternative programs and policies employed by governments internationally to support private rental housing, particularly those programs and policies intended to improve the quality, prolong the life or increase the supply of such housing. The review will cover the U.S., U.K., Western Europe, Scandinavian countries, Australia and Japan. This project will be of interest to property developers, private rental landlords and investors, the construction and renovation industry, mortgage lenders and insurers as well as federal and provincial housing policy analysts.

CMHC Project Officer: David Metzack

CIDN: 1885 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

LE SECTEUR LOCATIF PRIVÉ ET SA NOUVELLE CLIENTÈLE

This study examines the practices and concerns of multi-rental building owners in Montreal in a context of changing clientèle. Thirty randomly selected owners were interviewed by telephone during July 1998. The owners interviewed own buildings in four Montreal districts.

In theory if not in practice, there seems to be discrimination towards the social status, targeted especially at social welfare recipients. This reflects problems of residualization, i.e., tenants find themselves increasingly as the poorest households. The interviews also indicate that there is discrimination towards immigrants, especially Blacks. Although this study is not statistically valid, it seems nonetheless to indicate that segregation exists. The interviews lead one to believe that discrimination plays a role in having access to housing for certain populations.

The purpose of the study was to determine whether there were ways to support the owners in relation to this new clientèle. Very few owners see the need for support in their work. Several spoke of tenants' rights, difficulties with regard to social welfare recipients, but, except for legislative changes to collect rent from this population, they offered very few solutions. As regards inter-ethnic cohabitation, according to owners, there are few problems. On the one hand, this could confirm the "success story" that other studies have shown in Montréal and on the other hand, that the problems encountered, similar to those identified in the social sector are minimal. However, this lack of problems may also reflect the choice of the owners who try to satisfy their current tenants by choosing other tenants who are not too different.

Prepared by: Luba Serge. CMHC Project Officer: Benoît Sanscartier. Ottawa: Canada Mortgage and Housing Corporation, 1998 (External Research Program).

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

RENTAL HOUSING

UNDERSTANDING PRIVATE RENTAL HOUSING INVESTMENT IN CANADA.

The project will investigate rental housing investment in Canada and establish a basis from which public and private decision makers can clearly understand the environment for investment in, and development of, rental housing.

CMHC Project Officer: Tim Elliot

CIDN: 1748 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

RESIDENTIAL DEVELOPMENT

ALTERNATIVE PLANNING AND REGULATORY APPROACHES USED IN OTHER COUNTRIES.

The purpose of this study is to investigate and document international approaches to planning and development regulation, specifically, the use of performance based planning and financial/economic incentives. These approaches may offer useful lessons and insights in improving the flexibility and effectiveness of the development environment in Canada. In addition to existing documentation, the research will be based on interviews with government, development and academic informants in Australia, New Zealand, the United States and Europe. The information gathering stage of this project is complete and a report is being drafted for publication next year.

CMHC Project Officer: Steve Mennill

CIDN: 1775 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

COMMUNITY DESIGN: AN ANALYSIS OF DENSITY MEANINGS AND DEVELOPMENT OF A DESIGN TOOL.

This research addresses how Land Use Density stipulations can impact and/or interplay with various other system components (such as open space) of community plan-making. It will result in a Sustainable Community Design Tool component that will inform the process of “negotiated urban design” in arriving at midrange density prototypes acceptable to the broad community.

CMHC Project Officer: Doug Pollard

CIDN: 1998 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: William T. Perks
William Perks Professional Services & Brooke Associates Collaborative
201908 17th Avenue
Calgary, Alberta, T2S 2S2

AVAILABILITY: Publication not yet available

RESIDENTIAL DEVELOPMENT

CRITICAL SUCCESS FACTORS ENABLING ALTERNATIVE RESIDENTIAL DEVELOPMENT STANDARDS.

The purpose of this project is to study innovative examples of the application of alternative development standards. It will determine what the critical success factors are to enable the new standards to be implemented.

CMHC Project Officer: David D'Amour

CIDN: 2006 020001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Teresa Paul
10937-79th Avenue
Edmonton, Alberta, T6G 0P1

AVAILABILITY: Publication not yet available

THE ECONOMIC IMPACT OF SECONDARY SUITES ON URBAN INFRASTRUCTURE & SERVICES.

The purpose of this research is to investigate and summarize different approaches for determining the municipal servicing costs, both capital and operating, of secondary suites in established neighbourhoods and new subdivisions, through a literature review and key interviews.

CMHC Project Officer: Steve Mennill

CIDN: 2010 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Vanessa Geary
Tenants Rights Action Coalition
2681 East Hastings
Vancouver, British Columbia V5X 1Z5

AVAILABILITY: Publication not yet available

INCREASING URBAN DENSITIES TO ACCOMMODATE POPULATION GROWTH.

This project examines the issue of urban density in order to deal with population growth pressures, taking into account public policy and regulations, private development decisions, and urban form, with a view toward projecting the implications of growth in terms of built form, land consumption, infrastructure, and the distribution of housing.

CMHC Project Officer: Fanis Grammenos

CIDN: 1844 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Gerald Daly, Daly & Associates
Box 139, RR #4, Flesherton
Ontario, N0C 1E0

AVAILABILITY: Publication not yet available

THE INFORMATION REVOLUTION AND RESIDENTIAL DEVELOPMENT.

The objective of this research is to examine residential development within the context of the information revolution.

CMHC Project Officer: Benoit Sanscartier

CIDN: 2014 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Pamela Blais
182 Crawford Street
Toronto, Ontario M6J 2V6

AVAILABILITY: Publication not yet available

RESIDENTIAL INTENSIFICATION IN CENTRAL DISTRICTS.

The objective of this research is to examine the phenomenon of residential intensification in a dense urban sector using data on the new housing built there in the last five years and on the new residents of those dwellings. The study will focus on the Mile End neighbourhood of Montreal with the view to drawing lessons for the renewal of central districts in other Canadian cities.

CMHC Project Officer: Mark Holzman

CIDN: 2012 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Jocelyn Duff, Habitat sur mesure
4626 Bordeaux Street
Montreal, Quebec, H2H 2A1

AVAILABILITY: Publication not yet available

RESIDENTIAL STREET DESIGN: LEARNING FROM SUBURBIA.

The purpose of this research project is to generate concrete residential street design solutions based upon a thorough understanding of precedents, and introduce and stimulate new ideas for land developers and design professionals.

CMHC Project Officer: Fanis Grammenos

CIDN: 1644 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Sevag Pogharian , Sevag Pogharian Design
4643 Sherbrooke Street West, Suite 12
Montreal, Quebec, H3Z 1G2

AVAILABILITY: Publication not yet available

ROOFTOP GARDENS

ROOFTOP AND VERTICAL GARDENS: IDENTIFYING OPPORTUNITIES AND BARRIERS TO WIDESPREAD USE.

The purpose of this project is to develop a Canadian "status report" on rooftop and vertical gardens.

CMHC Project Officer: Susan Fisher

CIDN: 2005 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Steven Peck
35-859 Millwood Road
Toronto, Ontario, M4G 1W7

AVAILABILITY: Publication not yet available.

SENIORS

ÉVALUATION DU PROJET DE RÉAMÉNAGEMENT DE L'ENSEMBLE BENNY FARM: RAPPORT FINAL

The Benny Farm project in Montreal's Notre-Dame-de-Grâce district is made up of 384 housing units. The buildings in which these units are located date from the end of the Second World War. The units are in need of major repairs and increasingly less responsive to the needs of current tenants, since they were designed for families and are now occupied by small households and seniors. In addition to the low occupancy rate of these units, there is under-utilization of the available site (64 units per hectare).

For these reasons, CMHC has decided to refit the site and create 1,200 new housing units, approximately one-fifth of which will be reserved for current occupants, the majority of whom are veterans. Construction of the first phase of the project was completed in the Spring of 1997. This first phase made it possible to move a number of current residents (91 households) to new buildings designed specifically for seniors. The objectives of this research were to assess the relevance and efficacy of various aspects of the resident relocation strategy adopted by CMHC and the degree of appropriateness achieved with respect to residents' needs and expectations on the one hand and the new buildings to which they were relocated on the other.

This research was quasi-experimental in nature, since a pre-survey in the old units and a post-survey in the new made it possible to identify residents' attitudes and behaviours before and after the move. A questionnaire was also completed by eight of the major stakeholders to determine their views on the development and relocation process adopted by CMHC.

This research contributes valuable information, both on the resident relocation strategy adopted by CMHC and on the impacts of the new buildings and new apartments. It demonstrates a high level of respondent satisfaction with respect to the relocation process. The fact that the new units are universally accessible, modern and offer a set of amenities essential to an aging population also proved to be well-advised. Above all, the change of residence had positive effects for Benny Farm seniors, who improved their quality of life while participating in the various project development phases. These positive effects may be summarized as follows: increased mobility, physical and psychological health, residential satisfaction and satisfaction with their social life.

Prepared by Pierre Teasdale, Architect with the collaboration of the firm Écho Sondage and Danielle Maltais. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Luis Rodriguez. Ottawa: CMHC, 1998.

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre, Canada Mortgage and Housing Corporation
700 Montreal Road Ottawa, Ontario K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642 Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

HOME ENVIRONMENTS AND FALLS BY SENIORS.

The purpose of this project is to determine the significance of environmental factors that are likely to cause falls among independent and active seniors living in their own homes within the territory of the Québec Urban Community.

CMHC Project Officer: Luis Rodriguez

CIDN: 1843 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Benoît Lévesque
Centre de santé publique de Québec
2050 René-Lévesque Blvd.
Sainte-Foy, Quebec G1V 2K8

AVAILABILITY: Publication not yet available.

HOUSING FOR OLDER CANADIANS.

The objective of this project is to produce a comprehensive guide to planning, designing, developing, managing and marketing housing for older Canadians.

CMHC Project Officer: Luis Rodriguez

CIDN: 0869 0200001

Division: Research Division

STATUS: Completed Report

HOUSING OPTIONS FOR PEOPLE WITH DEMENTIA.

The objective of this project is to produce an illustrated and practical publication documenting innovative housing options for people with dementia.

CMHC Project Officer: Luis Rodriguez

CIDN: 1251 0200001

Division: Research Division

STATUS: Completed

INTERVENTION MODELS: SAFETY IN CASES OF EMERGENCY OF PERSONS WITH REDUCED MOBILITY AND SENIORS LOSING THEIR INDEPENDENCE LIVING IN REGULAR RESIDENTIAL ENVIRONMENTS

This study is aimed at integrating current knowledge and reflections concerning the problems associated with the safety of seniors and persons with disabilities living in regular residential environments, in order to apply them to the development of intervention models for three multiple-family buildings equipped with elevators.

CMHC Project Officer: Luis Rodriguez

CIDN: 460 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Sylvie Quintin, Société d'habitations communautaires logique inc.
3250 St-Joseph Blvd. East, Montreal, Quebec H1Y 3G2

AVAILABILITY: Publication not yet available

SENIORS

LIVING AT HOME OR IN A RESIDENCE: A CHALLENGE FOR SENIORS AND WORKERS

The objective of this project is to examine, in Quebec's Saguenay area, the circumstances, constraints, limitations and difficulties encountered by clients who receive home care and the organizations that provide it.

CMHC Project Officer: Luis Rodriguez

CIDN: 1641 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Danielle Maltais
Université du Québec à Chicoutimi
555 de l'Université Blvd.
Chicoutimi, Quebec
G7H 2B1

AVAILABILITY: Publication not yet available

PLANNING HOUSING AND SUPPORT SERVICES FOR SENIORS.

The objective of this project is to produce a new and improved version of the current CMHC publication "Maintaining Seniors Independence in Rural Areas: A Guide to Planning for Housing and Support Services" (NHA 6298).

CMHC Project Officer: Luis Rodriguez

CIDN: 1780 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

PREDICTING THE ADJUSTMENT OF ELDERLY PERSONS TO CONGREGATE CARE HOUSING.

The purpose of this project is to undertake research to complement the conventional post-occupancy studies which tend to emphasize assessing the housing environment rather than the well-being of individual occupants.

CMHC Project Officer: Glynis Kossatz

CIDN: 1827 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Dr. Robert Gifford, Optimal Environment Inc.
2311 Edgelow Street
Victoria, British Columbia, V8N 1R6

AVAILABILITY: Publication not yet available

THE PRIVATE RENTAL MARKET: ADAPTING TO THE NEEDS OF AGING TENANTS.

This research will identify the extent to which landlords in the private rental market across Canada are accommodating the needs of aging tenants, and describe and develop measures that would help landlords deal more effectively with tenant needs.

CMHC Project Officer: Luis Rodriguez

CIDN: 1996 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Kathleen Mancer, DKM Housing Consultants
141-6200 McKay Avenue
Burnaby, British Columbia, V5H 4M9

AVAILABILITY: Publication not yet available

LES RESSOURCES D'HÉBERGEMENT PRIVÉES DE LA PROVINCE DE QUÉBEC

This study, financed under the External Research Program of Canada Mortgage and Housing Corporation, achieves two main objectives. The study first presents an overview of the regional stocks of private retirement accommodation resources in the province of Quebec based on the inventory taken by the Centres locaux de services communautaires (local community service centres) in 1994-95. It then explores the results of a postal survey on home safety measures adopted in a sample of private accommodation resources in order to better meet the needs of their aging clients.

In its analysis of the provincial inventory data, the study highlights major disparities between regions in terms of the distribution of accommodation resources, particularly when these resources are classified according to size (i.e. the number of places offered). It should be noted here that nearly three quarters (1,432) of the 1,962 resources inventoried offer fewer than 25 places and yet these resources only provide 19.6% (12,913) of the 65,842 places offered in this market. It should also be mentioned that the Montreal and Laval regions offer close to 52.6% (34,631/65,842) of the places in the province and that slightly over 85% of these places are in resources with over 60 residents. Regional stocks of private accommodation resources are therefore structured or developed on the basis of very different profiles.

As for home safety, the study also shows disparities between smaller and larger resources. While a series of safety measures are generally adopted right away by the majority of retirement homes, the measures in place to meet the needs of seniors with cognitive difficulties are very limited.

Prepared by: Daniel Pelletier. CMHC Project Officer: Jean-François Dion. Ottawa: Canada Mortgage and Housing Corporation, 1998 (External Research Program).

STATUS: Completed Report

AVAILABILITY: Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.

SENIORS

USER SATISFACTION STUDY OF HOUSING OPTIONS FOR OLDER CANADIANS.

The objective of this research is to carry out user satisfaction studies of some of the newer housing options that are currently available to older Canadians, and to produce an objective and detailed report based on the results of the research.

CMHC Project Officer: Luis Rodriguez

CIDN: 1583 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

URBAN TRANSPORTATION

THE IMPACT OF URBAN FORM AND TRAVEL ACCESSIBILITY UPON PRIVATE VEHICLE TRAVEL.

The purpose of this study is to measure the influence of land use patterns and urban form on household travel demand and behaviour.

CMHC Project Officer: Susan Fisher

CIDN: 1752 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

METHODOLOGY TO ASSESS TRANSPORTATION GREENHOUSE GAS EMISSIONS FROM URBAN TRAVEL.

The purpose of this study is to compare the greenhouse gas (GHG) emissions from personal urban transportation given variations in community planning and design variables such as density and land use mix. The final product will be a quantitative tool that would be used by CMHC and its clients to evaluate development proposals for GHG emissions from private automobile use.

CMHC Project Officer: Susan Fisher

CIDN: 2041 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

CHRONIC HOMELESSNESS AMONG WOMEN: A DECADE OF CHANGING NEEDS AND SERVICES.

This research will constitute a retrospective review of the changing patterns of women's homelessness in the Toronto area. It will focus on chronically homeless women and innovative services, based on the observations and expertise of those who have worked closely with homeless women over the past decade (1987-1997).

CMHC Project Officer: Brenda Baxter

CIDN: 2000 0200001

Division: Research Division, External Research Program

STATUS: Ongoing Project

Grant Recipient: Sylvia Novac
593A Melita Crescent
Toronto, Ontario
M5G 3Y7

AVAILABILITY: Publication not yet available

INVESTIGATION OF ISSUES FOR THE EVALUATION OF THE NEXT STEP PROGRAM.

The purpose of this project is to conduct a literature review on second-stage housing for the Next Step Program.

CMHC Project Officer: Patricia Streich

CIDN: 1507 0500001

Division: Audit and Program Evaluation Services

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

WOMEN'S HEALTH AND WELL-BEING FROM A HOUSING PERSPECTIVE.

The objective of this project is to undertake and complete the study on the "State of Women and Their Housing: 1997," which develops a profile of women and their health and well-being from a housing perspective.

CMHC Project Officer: Tom Kerwin

CIDN: 1615 0100001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

HOUSING CANADA'S YOUTH.

The objective of this project is to develop social, economic, and demographic profiles of youth with an in-depth review of their current and past housing conditions, and identification and assessment of housing issues and trends into the future. The youth and rental repair studies should be out by the end of the year.

CMHC Project Officer: Roger Lewis

CIDN: 1786 0200001

Division: Research Division

STATUS: Ongoing Project

AVAILABILITY: Publication not yet available

"OUT FROM THE SHADOWS" - INTERNATIONAL SUMMIT OF SEXUALLY EXPLOITED YOUTH.

The purpose of this project is to gain knowledge regarding the housing-related options which can help address the key factors contributing to commercially, sexually exploited youth and the main obstacles to alleviating such circumstances.

CMHC Project Officer: Teresa van den Boogaard

CIDN: 1921 0200001

Division: Research Division

STATUS: Completed

BIBLIOGRAPHIES

- Alternative mortgage instruments / Nouveaux modes de financement hypothécaire
(Rev. 15 p., October/octobre 1984)
- Architecture in Canada / L'architecture du Canada
(18 p., July/juillet 1983)
- Building and climatic factors / Construction et des éléments climatiques
(7 p., November/novembre 1983)
- Building in cold climates / Construction dans les pays froids
(Rev. 9 p., December/décembre 1989)
- Building laws / Législation de la construction
(Rev. 25 p., October/octobre 1986)
- Building materials / Matériaux de construction
(14 p., August/août 1987)
- Building product information / Information sur les produits pour le bâtiment
(7 p., August/août 1984)
- Children in the urban environment / Les enfants dans le milieu urbain
(23 p., January/janvier 1993)
- Cohousing /Habitation communautaire
(8p., July/juillet 1996)
- Computer-aided architectural design / Dessins architecturaux par ordinateur
(Rev. 2 p., September/septembre 1984)
- Condominium conversion / Immeubles d'habitation - transformation en copropriétés
(12 p., May/mai 1986)
- Condominiums / Copropriétés
(Rev. 12 p., March/mars 1986)
- Congregate housing / Habitat collectif
(10 p., November/novembre 1991)
- Construction industry in Canada / Industrie de la construction au Canada
(Rev. 27 p., January/janvier 1988)
- Construction industry labour / Main-d'oeuvre de la construction
(6 p., February/février 1988)
- Cooperative housing / Coopératives de logements
(Rev. 40 p., September/septembre 1988)
- Crime prevention and architectural design / Design architectural et prévention de la criminalité (7 p., May/mai 1989)
- Crime prevention and urban safety in residential environments / La prévention du crime et la sécurité dans les milieux résidentiels urbains (12 p., September/septembre 1989)

- Deinstitutionalization
(7 p., June/juin 1988)
- Desktop Publishing
(3 p., March/mars 1988)
- Development rights transfer / Transfert de droits de développement
(8 p., December/décembre 1985)
- Discrimination and segregation in housing in Canada / Bibliographie sur la discrimination et la ségrégation dans le logement au Canada (5 p., November/novembre 1991)
- Downtown redevelopment / Réaménagement de centres-villes
(Rev. 26 p., January/janvier 1989)
- Earthquakes and construction / Tremblements de terre et construction
(20 p., March/mars 1995)
- Energy conservation in multiple housing / Économie d'énergie dans les logements collectifs
(Rev. 3 p., June/juin 1983)
- Examples of housing program evaluations / Exemples d'évaluations de programmes de logement (3 p., January/janvier 1982)
- Expandable housing / Les logements expansibles
(October/octobre 1985)
- Experimental houses / Maisons expérimentales
(6 p., January/janvier 1983)
- External Research Program Reports arranged by subject / Rapports du programme de recherche à l'extérieur par sujet (Rev. 56 p., September/septembre 1997)
- False Creek, Vancouver, British Columbia / False Creek, Vancouver, Colombie-Britannique (Rev. 4 p., November/novembre 1984)
- Federal/provincial relations and housing / Relations fédérales/provinciales et le logement (3 p., June/juin 1987)
- Foundations / Fondations
(17 p., January/janvier 1989)
- Geodesic domes / Domes géodésiques
(4 p., November/novembre 1983)
- Graduated payment mortgages / Prêts hypothécaires à paiements progressifs
(Rev. 3 p., October/octobre 1991)
- Group homes / Foyers de groupe
(Rev. 5 p., May/mai 1986)
- Halfway houses / Foyers de groupe
(Rev. 5 p., May/mai 1986)
- Home care vs institutional care / Soins à domicile ou en établissement
(3 p., April/avril 1982)
- Home equity conversion / Conversion de la valeur nette du logement
(9 p., October/octobre 1988)

- Home ownership / La propriété d'un logement
(Rev. 28 p., August/août 1987)
- *Homelessness / Sans-logis
(Rev. 61 p., June/juin 1998)
- House designs - annotated / Modèles de maisons - annotée
(12 p., June/juin 1984)
- Housing and AIDS / Hébergement des personnes atteintes du SIDA
(5 p., September/septembre 1993)
- Housing and services for the disabled / Logement et les services pour les handicapés (Rev.
68 p., April/avril 1992)
- Housing and the elderly / Le logement et les personnes âgées
(Rev. 78 p., September/septembre 1988)
- Housing conversion and residential intensification / Conversion d'habitations et
intensification résidentielle (Rev. 8 p., October/octobre 1990)
- Housing costs / Prix des maisons
(12 p., August/août 1985)
- Housing demand / La demande en logement
(22 p., November/novembre 1986)
- Housing density / Densité d'habitation
(7 p., September/septembre 1985)
- Housing for immigrants and minorities / Logement pour les groupes ethniques
et immigrants (7 p., May/mai 1993)
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Before You Renovate: Renovation Guide and Catalogue

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Canadian Response to Urban Governance Survey: OECD Group on Urban Affairs

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Crawl Spaces: How to Avoid Moisture and Soil Gas Problems

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Serviceability of Floor Systems with Wood-I-Joists and Concrete Topping

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CURRENT

HOUSING RESEARCH

Volume 6, No. 2-3

Autumn 1999

**SOCIAL,
ECONOMIC AND
TECHNICAL
RESEARCH**



CMHC  SCHL

HOME TO CANADIANS
Canada

CURRENT HOUSING RESEARCH

**Volume 6
Number 2-3
Autumn, 1999**

Issued also in French under the title: ***Recherches courantes sur l'habitation***

Publié aussi en français sous le titre: ***Recherches courantes sur l'habitation***

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INTRODUCTION

Welcome to "*Current Housing Research*". This publication merges "*Housing Research Quarterly*" and "*Current Housing Technology Initiatives*" and continues the numbering of the "*Housing Research Quarterly*".

Under Part IX of the National Housing Act the Government of Canada provides funds to Canada Mortgage and Housing Corporation to conduct research into the social, economic and technical aspects of housing and related fields.

Current Housing Research is compiled and produced three times a year by the Canadian Housing Information Centre. This publication provides information and access to research which is undertaken and sponsored by the Corporation. It is also available on CMHC's Website at chic@cmhc-schl.gc.ca

The publication contains information on completed research reports, new publications, videos and bibliographies, as well as planned and ongoing research projects. An alphabetical title index of items listed is included at the end for quick reference.

The overall arrangement of "*Current Housing Research*" is by broad subject category. Within each subject category, lists of planned and ongoing projects and completed research reports are described.

Each entry can contain the following elements:

- The project or report title;
- A description of the project or report results;
- The CMHC Project Officer who is managing the project;
- The Division within CMHC which is responsible for the project;
- For External Research Projects, the grant recipient undertaking the research;
- A Contract Identification Number (CIDN);

- The Status of the project: whether the project is in a planned, ongoing or completed phase. "Planned Projects" are those that are not yet underway, but are likely to be initiated in the current year. "Ongoing Projects" refer to research projects which are currently underway. No reports are yet available. Once the project is completed, and a report is available for distribution, it will be listed as a "completed report."

- Whether the report resulting from the research project is available and the address where the completed report can be obtained.

To discuss research projects that are recent or ongoing, please call CMHC General Inquiries at (613) 748-2000 and ask for the CMHC Project Officer identified under each project description.

CMHC's External Research Program

The objective of the CMHC External Research Program (ERP) is to encourage and enable researchers in the private and not-for-profit sectors to put forward and carry out relevant, innovative, and high quality housing research projects. Under the Program, financial contributions are made to support research investigations into important questions, problems, and issues affecting Canadian housing. Housing research priority areas are identified in the "External Research Program Grants for Housing Research Guidelines and Application Form".

Applicants to the External Research Program must be Canadian citizens or have permanent resident status in Canada.

Independent researchers as well as those employed in Canadian universities, institutions, private consulting firms, the professions and the housing industry may apply for these grants.

Full-time students at the graduate or undergraduate level are not eligible to apply. Students may be hired to assist in the conduct of the research, but under no circumstances may they take over responsibility for the direction of the work or the quality of the final report.

Individuals who are full-time federal, provincial or municipal government employees may apply. However, to be eligible, an applicant must provide a letter of support from her/his employer which shows that the proposed research is not part of, and will not interfere with, her/his regular work. CMHC employees are not eligible to receive grants under this Program.

CMHC is interested in receiving applications on topics related to its housing research priority areas. New ideas and innovative approaches in these areas are welcome.

To obtain the booklet outlining the priority research areas, the guidelines and application form for the External Research Program you may contact:

The Administrator
CMHC External Research Program
Research Division
Canada Mortgage and Housing Corporation
700 Montreal Road, Room C7-307
Ottawa, Ontario
K1A 0P7

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NOTE TO INTERNATIONAL CLIENTS

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RESEARCH REPORTS

Research reports are listed without a price in the "*Current Housing Research*". They are free to Canadian residents. However, to recover some of our distribution costs there is a fee to mail research reports to locations outside of Canada. The price for research reports mailed to destinations in the United States is \$10.00 for each report. The price for research reports mailed to destinations in other countries is \$15.00 for each report. Prices are payable in Canadian dollars. Research reports can be ordered from the address listed below:

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TECHNICAL RESEARCH

EVALUATION OF THE HOUSING INTERNSHIP INITIATIVE FOR FIRST NATIONS AND INUIT YOUTH

The purpose of this project is to undertake an evaluation study of the housing Internship Initiative for First Nations and Inuit Youth administered by CMHC as part of the federal government Youth Employment Strategy.

CMHC Project Officer : *Denys Chamberland*

CIDN : *2082 0500001*

Division : *B.C. & Yukon Business Centre*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

NATIVE TECHNICAL TRAINING - DEVELOPMENT OF TRAINING MODULES

The objective of this project is to provide a set of new and revised technical training materials to facilitate future CMHC and First Nations-sponsored builder training sessions.

CMHC Project Officer : *Tom Kerwin*

CIDN : *1750 0300002*

Division : *Research Division*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

PARTICIPATORY PLANNING PROCESSES WITHIN FIRST NATIONS COMMUNITIES

This project's purpose is to carry out the research project entitled "Participatory Planning Processes Within First Nations Communities".

CMHC Project Officer : *Raymond W Bursey*

CIDN : *2144 0200012*

Division : *Research Division*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

IMPACT DU BRUIT INDUSTRIEL SUR LES SECTEURS RÉSIDENTIELS ENVIRONNANTS: PORTRAIT DE LA SITUATION POUR LA BEAUCE ET POUR LA RÉGION DE QUÉBEC, ANALYSE DES LOCALISATIONS PROBLÉMATIQUES ET RECOMMANDATIONS

Residential sectors can be adjacent to sectors that are classified as commercial or industrial but, in many cases, the two functions are not compatible, whether on account of intense trucking activity, sporadic noise throughout the day or even continuous noise that can last well into the night. There are many complaints in this regard, in both urban and rural areas. Planners and legislators are generally powerless to resolve this issue. In existing conflict situations, both functions are well within their rights, that is, residents can demand peace and tranquillity, while industrialists can expect to work and operate their companies, without having any new constraints imposed on them. As for potential situations, in the case of new residential developments, for example, there is not always an in-depth environmental analysis, or else, the pressure from developers wins out over the viewpoints of planners and environmentalists.

In this context, the research project proposed to establish the situation regarding the impact of industrial noise using as its laboratory the Québec and Beauce areas, two areas that comprise numerous industrial parks adjacent to residential sectors. The Beauce area, in addition to its very active industries, has a topography that is conducive to the concentration of urbanization and human activities. The principal objectives of the project were as follows:

- establish the scope of the problem of the impact of industrial noise on the closest residential sectors;
- measure and map the noise in the residential sectors deemed the most critical (with special consideration given to industries operating 24 hours a day);
- verify the causes of the situations analyzed (uncontrolled growth of residential developments, poor industrial planning or indifference of the industrial sector);
- identify the provincial and municipal legislative situation;
- analyze the possible mitigating actions (in particular, using computer modelling), such as reducing or controlling the level of noise at the source, or introducing protective measures, which could potentially include landscaping; and, finally,
- compile the results in a regional perspective, for both the survey of the situation and the recommendations.

Among all the industrial zones and parks visited, 15 sites were retained and analyzed in the Beauce area and 27 in the greater Québec area. The research project made it possible to document and clarify an often neglected aspect of residential environment quality and also to propose a few avenues for more sustainable solutions, to the attention of planners, industrialists, municipalities, and even developers.

Prepared by Jean-Gabriel Migneron, Pierre Côté, Wu Weixion. CMHC Project Officer: Sandra Marshall. Ottawa: Canada Mortgage and Housing Corporation, 1998. (External Research Program)

STATUS : Completed Report

AVAILABILITY : Canadian Housing Information Centre
Canada Mortgage and Housing Corporation

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SOUND AND FIRE PERFORMANCE OF FIRE STOPS IN MULTI-FAMILY DWELLINGS: FLANKING TRANSMISSION AT JOINTS IN MULTI-FAMILY DWELLINGS: PHASE I: TRANSMISSION VIA FIRE STOPS

Fire stops can introduce a physical connection between the two sides of a double-stud wall, hence providing structural flanking paths for transmission of vibration which worsens the sound insulation.

This study primarily addressed the specific case of a load-bearing party wall with double wood studs, supporting a floor with wood joists perpendicular to the party wall and a floor deck or sub-floor of 15.9 mm OSB.

Even without structural transmission of vibration through a fire stop, the sound insulation in a real building is normally affected by flanking transmission.

Addition of a fire stop provides yet another path for vibration transmission between the rooms, and hence tends to worsen the sound insulation further. This study examines how a fire stop at the floor/wall junction can degrade the apparent sound insulation of the party wall (the nominal separation) by increasing structural transmission of vibration around that wall via the connected floor system (the flanking path).

Prepared by T.R.T. Nightingale, R.E. Halliwell, Institute for Research in Construction, National Research Council. Prepared for: Canada Mortgage and Housing Corporation ... et al. CMHC Project Officer: Jacques Rousseau. Ottawa: CMHC, 1997.

STATUS : Completed Report

AVAILABILITY : Canadian Housing Information Centre

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BASEMENT WALLS THAT DRY: FINAL PROJECT REPORT

An eighteen month study was undertaken to evaluate the abilities of 10 basement wall insulation/framing options to dry after being subjected to either a controlled leak or a short term flood. Conventional wood framed construction, steel stud construction and three proprietary systems were evaluated. The proprietary systems included a new product from Owens Corning which is a vinyl faced rigid fibreglass system which can be installed without wood or steel framing, an extruded polystyrene insulation system, Perimate from Dow and a sprayed in place polyurethane insulation. Five variations of conventional wood stud framing were evaluated. The differences evaluated ranged from the use of an external moisture barrier to standing the framing off walls and floors to the use of Densglas as an alternative to gypsum board. The two steel stud systems tested varied only in stand off from the basement wall.

In general all of the proprietary wall systems performed better than the wood framed or steel stud systems. The systems either did not absorb significant amounts of moisture or dried relatively rapidly after wetting. This was observed whether the moisture source was a controlled leak or a short term flood.

The steel stud systems performed better than their wood framed counterparts when subjected to a short term flood. The steel studs, having no capability to retain moisture, dried out more quickly than the wood systems.

Of the wood framed systems tested none appeared superior in both cases; controlled leak or flood. In the case of a controlled leak, such as might occur in the event of a crack in a basement wall, the systems that had an external moisture barrier caused the water to flow down the wall, under the bottom plate and into the basement. Because such system systems were never really wetted they appeared to offer superior performance. When the source of the moisture was a flood the opposite appeared to be true. It was not possible to "seal" the panels, nor was any real attempt made to do so. When standing in 100 mm of water during a "flood" the liquid found its way into all panels, regardless of whether a moisture barrier was present. Once in the panel the moisture remained longer in panels equipped with a moisture barrier. In other words the moisture barrier inhibited moisture removal.

Aside from some darkening in the bottom plate of two of the wood framed panels the study was unsuccessful in producing significant growth of mold or mildew. Conditions were generally favourable; surface moisture and wood moisture contents in excess of 25% for months but no infestations occurred. This may be due to the lack of spores which must be present to initiate growth.

Prepared by Tom W. Forest and Mark Y. Ackerman. Ottawa: Canada Mortgage and Housing Corporation, 1999.

STATUS : Completed Report

AVAILABILITY : Canadian Housing Information Centre

Canada Mortgage and Housing Corporation

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IMPROVED BASEMENT PERFORMANCE

Concerns have been expressed by a number of authorities about the quality of construction of new basements. Technical and cost issues pertaining to the overall performance of poured-in-place concrete basements will be examined. The Canadian Standards Association (CSA), with CMHC and industry support, will improve the standard CAN3-A438-M84: Concrete Construction for Housing and Small Buildings. This standard addresses requirements for poured-in-place concrete basements. Several task groups are working to update this standard.

CMHC Project Officer : Don Fugler

CIDN : 1259 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

PERFORMANCE GUIDELINE DEVELOPMENT FOR BASEMENT SYSTEMS AND MATERIALS

CMHC is a participant contributing research to this multi-disciplinary, multi-agency study led by the National Research Council identifying knowledge gaps in the performance of basement systems. Guidelines will be developed for design, construction and evaluation of basement materials and systems to ensure their durability and long-term performance. Field work is largely complete. The reports on various aspects are being written.

CMHC Project Officer : Don Fugler

CIDN : 1421 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

SLIDE PRESENTATIONS ON TWO FOUNDATION TYPES AND TO MONITOR THE PERFORMANCE OF THE EXAMPLES OF THE TWO FOUNDATION SYSTEMS

The purpose of this project is to undertake and complete the development of two slide presentations and the monitoring of two foundations over a one-year period. The slide presentations will be integrated into the First Nations builder training curriculum materials.

CMHC Project Officer : Tom Kerwin

CIDN : 1813 030000

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

AUSTRALIAN BUILDING REGULATORY REFORMS

To conduct further research into Australian building regulation and liability reforms by documenting the Australian experience with the reforms to date, examining the issues encountered with respect to the application of the reforms to the housing sector. The Commonwealth Government of Australia and individual Australian states have introduced reforms to the regulatory environment in order to reduce costs and barriers associated with development and construction. Some of the reforms include a transition to objective based building codes, the introduction of compulsory job-specific warranty-type insurance programs, limitations on liability for building practitioners, privatization of building approvals and inspections and compulsory registration of building professionals. This project documents the reforms implemented in the State of Victoria based on a review of documentation and regulations and interviews with key actors. The status of similar reforms in other states and territories is reported. A draft report has been received and is being reviewed for publication in the fall of 1999.

CMHC Project Officer : Mark Holzman

CIDN : 2185 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

FUTURE OF CANADIAN STANDARDS FOR RESIDENTIAL CONSTRUCTION

The objective of this project is to build on the March/97 report of the Joint Task Force of the Canadian Commission on Building and Fire Codes/Provincial/Territorial Committee on Building Standards (PTCBS/CCBFC) by documenting recent changes in standards specifically related to the housing industry, describe the role and importance of standards in the housing industry and examine the issues and implications for various futures of each category of the standards.

CMHC Project Officer : Doug Pollard

CIDN : 2027 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

ADJUST-A-FORM

The objective of this project is to develop ideas for adjustable, reusable forms. Specifically the project includes the inception to the development of a specific product ready for marketing. The end result will be a product that saves builders time and material and therefore project costs.

CMHC Project Officer : Darrel Smith

CIDN : 1501 0200001

Division : Research Division

STATUS : Ongoing Project

Housing Technology Incentives Program

AVAILABILITY : Publication is not available

BUILDING AND RENOVATING WITH SALVAGED MATERIALS: A REUSE WORKPLAN

The objective of this project is to develop and test design procedures and specification guidelines in the form of a workplan by which design professionals and builders can effectively salvage and reuse materials in building projects including demolition and renovation or new construction at a residential scale.

CMHC Project Officer : Darrel Smith

CIDN : 2023 0200001

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

COMPRESSED EARTH BLOCK CONSTRUCTION

The objective of this project is to officially approve the material "earth", to allow architects, builders and self-builders to make use of earth construction.

CMHC Project Officer : Chris Ives

CIDN : 2004 0200001

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

DURABILITY AND SERVICE LIFE OF MULTI-UNIT RESIDENTIAL BUILDING ELEMENTS AND EQUIPMENT

A Delphi study is currently underway to collect information from property managers, property management firms and experts in differing fields such as ventilation systems, elevators, walls, parking garages, etc., to determine, from their experience, the service life of these elements. The study is expected to provide data on building elements which in some cases would have low or high durability variances. Follow-up research could then be undertaken to investigate why those building elements have these high variances.

CMHC Project Officer : Ken Ruest

CIDN : 1915 0200002

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

PERFORMANCE OF PLASTIC AND COMPOSITE MASONRY TIES

The purpose of this project is to investigate the possibility of the alternative material (plastics or composites) application to masonry ties. Detailed research to determine what has been done in the field of masonry ties around the world will be investigated, followed by the evaluation of the information.

CMHC Project Officer : Luis de Miguel

CIDN : 2144 0200020

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

RE-USE: INTEGRATION OF USED BUILDING MATERIALS INTO NEW CONSTRUCTION

The objective of this project is to promote the practice of re-use of building materials as a viable approach in the 3Rs of sound environmental practice for the construction industry, presently including waste management through recycling and reduction. Research will address 4 main concerns: economic, environmental, legislative/practical and perceptual -- presently barriers to viability in practice.

CMHC Project Officer : Darrel Smith

CIDN : 1842 0200001

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

THE MACROECONOMIC IMPACT OF THE BUILDING MATERIALS INDUSTRY IN CANADA

Using input-output (I-O) data and a well-known macroeconomics model of the Canadian economy, this study estimates the economic impact of the Canadian building materials industry in terms of national income and employment for the years 1995 and 1989. The study covers sub-industries producing:

- gypsum, wallboard and accessories;
- plumbing fixtures and fittings;
- windows and doors;
- roofing;
- insulation and air barriers;
- heating and air conditioning systems;
- exterior cladding;
- flooring;
- concrete products;
- ready-to-use lumber;
- paints and related products;
- textile floor coverings;
- kitchen cabinets; and
- floor and wall coverings, excluding vinyl.

For each sub-industry, impacts are broken down into:

- direct impacts, occurring within the sub-industry itself;
- indirect impacts, occurring in industries that supply the sub-industry with raw materials and other inputs; and
- induced impacts, generated throughout the economy as households spend income earned as a result of direct and indirect impacts.

Prepared by Geoff Bromfield, Martha Justus, Keith May, Informetrica Limited. Ottawa: Canada Mortgage and Housing Corporation, 1999. (Housing Affordability and Finance Series: Research Report)

Order number: PE0325 **Price: \$12.95 + GST and handling charges.

STATUS : Completed Report

AVAILABILITY : CMHC Information Products

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DEVELOPMENT OF A NEW EDITION OF THE STANDARD FOR CONCRETE CONSTRUCTION FOR HOUSING AND SMALL BUILDINGS (CSA A438)

The purpose of this project is:

- to carry out a review of the literature pertaining to current failures of concrete in residential basements, specifically addressing the high incidence of foundation wall cracking and water penetration.
- to determine how the delivered ready-mix might be improved in crack-resistance and how on-site concreting practices might be remedied; and
- to bring standard A438 into line with the requirements of the 1994 edition of CSA 23.1 Standard Concrete Materials and Construction.

CMHC Project Officer : Don Fugler

CIDN : 1259 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY :

Publication is not available

INVESTIGATION AND REPAIR STRATEGIES FOR CONCRETE CONSTRUCTION AND CATALOGUE OF INNOVATIVE CONCRETE ASSESSMENT AND REPAIR TECHNOLOGIES

The purpose of this project is to create a survey questionnaire on concrete assessment, repair and monitoring strategies and report on existing protocols regarding concrete problems in multi-unit residential buildings.

CMHC Project Officer : Silvio Plescia

CIDN : 1890 0200002

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

CONCRETE

STANDARDIZATION OF CONCRETE REPAIR PROTOCOLS

This project will research current assessment, monitoring and repair strategies for concrete repair. Existing protocols commonly used in the field as well as existing protocol guidelines assembled by various agencies (eg. CSA) will be catalogued. This research will provide consultants, contractors and building owners with available protocols and concrete repair strategies.

CMHC Project Officer : Silvio Plescia

CIDN : 1890 0200002

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

CONSUMER PROTECTION

ISSUES PAPER ON LIABILITY IN HOUSE CONSTRUCTION

The Canadian Home Builders Association (CHBA) has expressed a concern that, in housing construction, it is becoming less clear who is liable for specific aspects relating to the house. They also are concerned that, as a result of cutbacks, municipalities are not carrying out inspections to the extent they once did and may be losing the capacity to properly enforce building regulations. This joint project, co-funded by CMHC and CHBA and managed by CHBA, will produce a paper discussing the issue of liability in housing construction across Canada and identify who is and is not liable. It will serve as the basis for discussion on these issues and for further study. The National Research Council (NRC) will also be a participating partner as the agency responsible for code development. An initial draft was prepared and the project was extended to include provincial consultations at CHBA's request.

CMHC Project Officer : Mark Holzman

CIDN : 1920 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

CONSUMER PROTECTION

OVERVIEW OF CONSUMER PROTECTION FOR HOUSING IN CANADA

For most Canadians buying a house is the largest financial expenditure they are ever likely to make. On an ongoing basis, housing represents a major component of household expenditures whether for mortgage or rent payment, maintenance and repairs or renovations and improvements. Canadian consumers have increasingly expressed concerns about dealing with the home building and renovation industry. These concerns have contributed to low consumer confidence in the housing industry, as measured by various public opinion research. Builders and contractors have also expressed concerns regarding issues of liability with respect to housing construction deficiencies and operating problems. New home warranty programs exist to provide some protection for purchasers of new housing but vary in terms of time limits, eligible components and financial limitations. This study will provide an overview of the context and issues surrounding consumer protection for housing in Canada. Information will be collected to produce an inventory of available programs, initiatives and activities addressing consumer protection including warranty programs, inspection services, consumer information products, training activities, etc.

CMHC Project Officer : Mark Holzman

CIDN : 2135 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

CONTAMINATED LANDS

DEMONSTRATION OF SAFE HOUSING ON LIGHTLY CONTAMINATED LANDS

CMHC research into contaminated lands shows that some types of soil contaminants could be rendered innocuous through building design and operation. One example is heavy metals deep within the soil. If these pollutants can be avoided through design, the cost of land remediation could be greatly reduced. The project will include contaminant monitoring and the investigation of the predictive capabilities of site specific risk assessments.

CMHC Project Officer : Don Fugler

CIDN : 1946 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

CONTAMINATED LANDS

EVALUATION OF SITE SPECIFIC RISK ASSESSMENTS FOR HOUSES

The objective of this project was to assess the accuracy, reproducibility, and utility of site specific risk assessments for houses. A description of a hypothetical contaminated site was submitted to nine risk assessment consultants and they provided "screening level" assessments on the health risks experienced by residents of houses built on that site. The risk assessments varied widely, by several orders of magnitude. A research report has been issued on the work. It discusses how the consultants differed in their risk assessments, the source of the assessment variation, and how the assessments could be improved.

The final task is for the contractor to submit an article on project findings to a peer-reviewed journal on risk assessment.

CMHC Project Officer : Don Fugler

CIDN : 1534 0200002

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

DOORS AND WINDOWS

DESIGN OF DURABLE JOINTS BETWEEN THE WINDOWS AND THE ENVELOPE

The objective of this project is to establish construction, parameter and calculation method concepts to improve the durability of joints between walls and windows.

CMHC Project Officer : Jacques Rousseau

CIDN : 1839 0200001

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

INFLUENCE OF AIR INFILTRATION ON THE ENERGY EFFICIENCY OF RESIDENTIAL WINDOWS

The objective of this project is to propose a new way of accounting for air infiltration in energy efficiency calculations for windows.

CMHC Project Officer : Ken Ruest

CIDN : 2002 0200001

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

ASSESSING THE ENERGY IMPACT OF VENTILATION AND INFILTRATION IN MULTI-UNIT RESIDENTIAL BUILDINGS: FIELD INVESTIGATION OF ENERGY IMPACT OF CORRIDOR AIR VENTILATION SYSTEMS

A research project has been initiated to study the seasonal impact of the operation of corridor air ventilation systems in multi-unit residential buildings on heating season energy consumption. Traditionally, it was assumed that corridor air systems should be shut down during periods of low occupancy and/or occupant activity in order to reduce energy consumption. However, it is also suspected that shutting off a natural gas-fired corridor air system in an electrically heated building, may actually increase energy consumption. Both of the aforementioned assumptions are based on the theory that corridor air systems are capable of effective and efficient air delivery - which is now known to be incorrect. The research will attempt to determine the influence that the operation of corridor air systems within 4 buildings has on energy consumption. The systems will be cycled on and off over a sufficient period to allow for an analysis of trends in resultant energy consumption. This study will help to characterize the costs of operating corridor air systems and will also serve to identify energy efficiency strategies.

CMHC Project Officer : Duncan Hill

CIDN : 1934 0200004

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

CMHC EMPTIED HEAT, AIR AND MOISTURE TRANSPORT MODELLING PROGRAM

The purpose of this project is to provide engineering services to upgrade the CMHC EMPTIED Program from a DOS to Windows environment and to compile the necessary weather data to allow the program to evaluate the performance of wall systems in major cities of the U.S. and Canada

CMHC Project Officer : Silvio Plescia

CIDN : 1107 0300003

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

ENERGY EFFICIENCY CASE STUDIES OF MULTI-UNIT RESIDENTIAL BUILDINGS

CMHC is in the process of documenting the application of energy efficiency measures in multi-unit residential buildings to be used as case studies. A trial case study of a housing co-operative in Ottawa is underway, to not only assess the strengths and weaknesses of the energy efficiency measures implemented, but also to identify what information can be disseminated to others in the building industry. Upon completion of this first case study, CMHC will be soliciting the housing industry for additional energy efficiency case studies. A compendium of case studies will be made available from CMHC. The case studies will also support the Energy Efficiency Opportunities Manual for Multi-Unit Residential Buildings that CMHC is in the process of developing.

CMHC Project Officer : Duncan Hill

CIDN : 1899 0200002-3

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

ENERGY EFFICIENCY OPPORTUNITIES MANUAL FOR MULTI-UNIT RESIDENTIAL BUILDINGS

CMHC, in partnership with the Ontario Ministry of Municipal Affairs and Housing (OMMAH), is in the process of developing a manual that details energy efficiency measures for existing multi-unit residential buildings. The document will be based on one originally developed by the Ontario Ministry of Housing in the early 1980's. The new manual will offer proven, current energy efficiency measures for the building envelope, mechanical, electrical, and domestic hot water heating systems. A project steering committee consisting of members of the housing, utilities and government agencies has been formed to provide comment on the manual as it is developed. The manual will be modularized and provided in a format that will be easily updated over time.

CMHC Project Officer : Duncan Hill

CIDN : 1887 0200002

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

EVALUATION OF EMBODIED ENERGY FOR THE CONSERVATION CO-OPERATIVE

The objective of this project is to complete the evaluation of embodied energy for the Conservation Co-operative case study documentation.

CMHC Project Officer : Sandra Marshall

CIDN : 1817 0300002

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

FOUNDATION PAPER ON COMMUNITY ENERGY PLANNING

Following the recent Kyoto summit on climate change, the federal government recently established fifteen "Issue/Sector Tables" to examine the costs and impacts of implementing Canada's greenhouse gas reduction targets. CMHC is a member of the "Municipalities Table" and co-chairs the subcommittee on "Community Energy Planning" (reporting to the Municipalities Table). CMHC recently funded the development of a Foundation Paper on Community Energy Planning to examine the potential energy savings and greenhouse gas emission reductions associated with integrated transportation and land-use planning, community energy systems (cogeneration, district heating, etc.), and other energy management options.

CMHC Project Officer : Brian Eames

CIDN : 2078 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

INTERNATIONAL ENERGY AGENCY (IEA) : ENERGY RELATED ENVIRONMENTAL IMPACT OF BUILDINGS

This four-year project, scheduled to end in 2000, is an IEA activity in which 14 countries are collaborating in the development of life-cycle energy modelling. Information will be compiled and published on the methodology and life-cycle environmental impact data. Examples will be developed of how methods may be applied to different building types and sources of expertise, with the potential for extending the influence of the task directly into academia. CMHC is acting as the Operating Agency for this project.

CMHC Project Officer : Thomas Green

CIDN : 1629 0200002

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

LABORATORY TESTING OF DENSE PACK CELLULOSE FOR ATTIC INSULATION

Some insulators claim that dense packing of cellulose insulation into hard to reach cavities (e.g. flat roof attics) prevents air movement along with providing insulation. Hydro Québec looked at the technique for upgrading attic insulation of flat roof housing, largely in Montreal. CMHC and the Société d'habitation du Québec (SHQ) also contributed funds to this project. The field work is complete. CMHC is discussing with Hydro Québec ways of publishing the report or a condensation of its findings.

CMHC Project Officer : Don Fugler

CIDN : 1377 02010001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

MÉTHODE D'ESTIMATION ÉNERGÉTIQUE DES BÂTIMENTS D'HABITATION BASÉE SUR L'APPLICATION DE L'INTELLIGENCE ARTIFICIELLE

The objective of this project was to develop a rapid method of estimating energy use in highrise residential buildings, by the application of artificial intelligence. The method gives a variety of results, such as total energy consumption, power load, heat and cooling consumption, and takes into consideration such variables as apartment orientation, occupancy schedules, and the interaction of HVAC and envelope systems.

The work consisted of:

- Creation of data bases which classify the parameters of the energy simulations, modeling and validation of the results using DOE-2;
- Application of neural networks including training and validation of the results;
- Development of the simulation for residential buildings; and
- Validation of the simulation program.

The program at this stage has been developed for climatic conditions similar to Ottawa, which will be expanded at a later stage. It was tested to verify its accuracy using a previously monitored Ottawa highrise. It provides the total building energy consumption as well as the use by apartments, corridors and parking, with the power loads. The data entry and results interfaces can be modified as well. The program was developed using the MatLab environment: for a larger application, the program would need to be translated into C++ language.

*Prepared by Stanislaw Kajl and Marc-Antoine Roberge. CMHC Project Manager: Sandra Marshall.
Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)*

STATUS : Completed Report

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OPTIMIZE: A METHOD FOR ESTIMATING THE LIFECYCLE ENERGY AND ENVIRONMENTAL IMPACT OF A HOUSE

This computer program estimates the lifecycle energy requirements of a house as well as determining associated emissions. The program has been revised from a spreadsheet to a database to improve the instructions and user interface, and the computational speed. The application of the program is being expanded to include multiple, non part 9 national building code residential buildings by using Optimize to assess the lifecycle energy performance of the Conservation Co-op building in Ottawa.

CMHC Project Officer : Thomas Green

CIDN : 0865 0201002

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

PREPARATION OF AN EXECUTIVE OVERVIEW OF THE R-2000 HOME SYSTEM

The purpose of this project is to develop a comprehensive overview of the R-2000 housing system.

CMHC Project Officer : Sylvain Lasnier

CIDN : 1550 0900002

Division : Canadian Housing Export Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

RE-INSULATING WITHOUT ANY CONDENSATION PROBLEMS - EFFECT OF ADDING INSULATION ON THE DISPERSAL OF EXFILTRATING AIR.

The objectives of this project are: 1. To test a method of characterizing air exfiltration, experimentally and analytically. 2. To determine the impact of two insulation strategies - from inside and from outside - on the dispersal of exfiltrating air through various types of joints.

CMHC Project Officer : Sandra Marshall

CIDN : 1853 200001

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

RENTAL STOCK ENVELOPE SURVEY

The STAR Database, used for modeling Canadian housing performance, requires data from a representative number of rental houses. This project looked at rental housing stock to see how it differs from owner-occupied stock and examined how rental stock could be suitably sampled for inclusion in the STAR Database. The findings show that rental stock does differ significantly from owner-occupied stock and that STAR needs to be upgraded if it is to represent rental stock. The contractor estimated that data on an additional 175 to 200 houses would be required. Options for obtaining this data are being considered.

CMHC Project Officer : Don Fugler

CIDN : 1766 0200002

Division : Research Division

STATUS : Completed

AVAILABILITY : Publication will not be published

UPDATING THE AIRTIGHTNESS TESTING STANDARD

The airtightness testing standard, Canadian General Standards Board (CGSB) 149.10, was published in 1986 and requires updating and simplification. CMHC has engaged CGSB and a contractor to undertake this work in 1998/99. A draft standard has been submitted to CMHC for review and detailed appendices are being rewritten prior to sending the standard out for ballot.

CMHC Project Officer : Don Fugler

CIDN : 1971 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

VENTILATION IN 2 OR 3 UNIT MULTI-FAMILY BUILDINGS BEFORE AND AFTER WEATHERIZATION

This project will provide insight into how energy retrofits affect the performance of the house as a system for 2 or 3 unit multi-family buildings. This study will characterize the known air leakage performance of 2 -3 storey walk up apartment buildings. A computerized air flow model will be used to evaluate how changes in airtightness will potentially affect indoor air quality indicators.

CMHC Project Officer : Duncan Hill

CIDN : 2144 0200018

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

COSTS AND BENEFITS TO MUNICIPALITIES OF MANDATORY RESIDENTIAL FIRE SPRINKLERS: SUMMARY REPORT

This report presents the results of a study to assess, from an economic perspective, the costs and benefits to municipalities of the mandatory installation of fire sprinklers in all new residential construction. The study was commissioned by Canada Mortgage and Housing Corporation (CMHC), with the participation of the Ontario Ministry of Municipal Affairs and Housing, and the Office of the Ontario Fire Marshal. The National Research Council and Federation of Canadian Municipalities were also involved in the project. In Phase 1, the economic model was developed and tested using data collected from two Ontario case study municipalities, Barrie and Burlington. Subsequently, in Phase 2, revisions to the method and economic model were made and four additional case studies were carried out. The Phase 2 case study municipalities were Edmonton, Alberta; Pitt Meadows, British Columbia; Gatineau, Quebec; and Kawacatoose First Nation, Saskatchewan.

The study examines the benefits and costs of automatic sprinklers and estimates the effect of mandatory sprinklers on the cost of providing municipal fire protection services. The study also identifies the impact of sprinklers on the cost of housing development, construction and maintenance. Municipal costs, such as potential changes in municipal infrastructure, municipal insurance premiums and fire department facilities and operations, have been considered. Development costs, such as the direct provision of infrastructure or the payment of development charges, are examined. Direct construction costs, such as the installation of the sprinkler system, and ongoing operating and maintenance costs for the homeowner, are also identified.

Prepared by: Arencon Inc. with the assistance of Clayton Research Associates Limited, Graham Harmsworth Lai & Associates Ltd., and J.G. Henderson & Associates. CMHC Project Managers: Tom Kerwin, Mark Holzman, Nicole Parent. Ottawa: Canada Mortgage and Housing Corporation, 1999, c1998. (Housing Affordability and Finance Series Research Report)

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FIRE RESISTANCE TESTS ON FULL-SCALE FLOOR ASSEMBLIES

This report presents the results of 32 standard fire resistance tests conducted on full-scale floor assemblies as part of the collaborative industry-government research program investigating the effects on the fire resistance of lightweight floor assemblies of subfloor material, gypsum board screw spacing from board edges, wood-I-joist type, method of fastening the gypsum board butt ends, insulation type, number of gypsum board layers, joist spacing, resilient channel spacing, addition of concrete topping, steel/concrete composite systems and structural load.

Prepared by: M.A. Sutan, Y.P. Seguin, P. Leroux, Institute for Research in Construction, National Research Council. Prepared for Boise Cascade Corporation, Canada Mortgage and Housing Corporation, Canadian Home Builders' Association ... et al. CMHC Project Officer: Jacques Rousseau. Ottawa: CMHC, 1998.

STATUS : *Completed Report*

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IMPACT ON LIFE RISK OF MANDATORY SPRINKLERS IN RESIDENTIAL BUILDINGS

The fire risk assessment model, developed by the National Research Council of Canada (NRC), was used to assess whether an apartment building with sprinkler protection but with increased fire department response time provides a level of fire safety for the occupants equivalent to that in a building without sprinkler protection but with the current fire department response time. The NRC model is called FiRECAM™ (Fire Risk Evaluation and Cost Assessment Model). The model assesses the expected risk to life and the fire costs in a building based on the dynamic interaction of fire and smoke spread, occupant evacuation and fire department response.

In this study, a 3-storey apartment building is used as a representative building in a new development area of a municipality, where buildings may range from a single family house to a medium-rise apartment building. The expected risk to life to the occupants is assessed with and without added sprinkler protection and with two levels of fire department response: with and without new fire stations.

New development areas in five cities are used in this study. They are Barrie and Burlington in Ontario; Pitt Meadows, B.C.; Edmonton, Alberta; and Gatineau, Quebec. In each municipality, the response times of the fire department are calculated using existing fire stations and added new stations. Future stations were previously determined by the municipal fire departments to meet protection needs for projected populations. In addition, the impact of mandatory sprinklers in an existing First Nations Community, Kawacatoose in Saskatchewan, is also assessed.

The results of this study show that, using a 3-storey apartment building as a model building, the provision of sprinkler protection and a longer than normal fire department response time (i.e. no new fire stations) provides a level of fire safety better than the case without sprinkler protection but with a normal fire department response time (i.e. with new fire stations). Based on similarity considerations in fire and smoke spread and occupant evacuation between single family houses and apartment buildings, the impacts of mandatory sprinklers on the expected risk to life, obtained for 3-storey apartment buildings, are argued to be applicable to single family houses.

Prepared by D. Yung, G.V. Hadjisophocleous, N. Benichou and Q. Liu. Prepared for Canada Mortgage and Housing Corporation. Ottawa: Institute for Research in Construction, National Research Council Canada, 1999.

STATUS : Completed Report

AVAILABILITY : Institute for Research in Construction

National Research Council Canada

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INVESTIGATION OF SMOKE CONTROL IN HIGH-RISES BY POSITIVE PRESSURE VENTILATION

A research project has been initiated to study the use of positive pressure ventilation (PPV) systems to contain and expel smoke from high-rise buildings during a fire emergency. PPV systems have been used in the U.S. in low-rise buildings. The system consists of a portable, high velocity fan which is used by the fire department to clear smoke from buildings in order to facilitate access to the fire and to aid in occupant evacuation. Preliminary studies have been conducted in multi-unit residential buildings but not in cold climates where stack effect may continue to dominate smoke movement. The research program is the result of a joint venture between CMHC, the City of Ottawa Fire Department and the Fire Laboratory of the Institute for Research in Construction of NRC. The ability of PPV to contain and clear smoke from exitways in high-rise buildings will be evaluated at the Fire Laboratory's full scale test building under both summer and winter conditions. If successful, PPV may offer Fire Departments an effective, lower cost, life and property saving tool.

CMHC Project Officer : *Duncan Hill*

CIDN : *1983 0200002*

Division : *Research Division*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

LEARN NOT TO BURN CURRICULUM FOR ABORIGINAL COMMUNITIES

The purpose of this project is to modify the Learn Not to Burn curriculum, successfully developed and used by the U.S. National Fire Protection Agency (NFPA), for usage in Canadian First Nations communities. The Aboriginal curriculum has been developed by the Assembly of First Nations, with the assistance of the NFPA, the Aboriginal Firefighters' Association and CMHC, pilot tested in several First Nations classrooms, and will be available for K-2 modules in late 1999.

CMHC Project Officer : *Alain Croteau*

CIDN : *1719 0300001*

Division : *Assisted Housing Division*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

SOUND AND FIRE PERFORMANCE OF FIRE STOPS IN MULTI-FAMILY DWELLINGS: FIRE SPREAD IN WALL-FLOOR JOINTS OF MULTI-FAMILY DWELLINGS

This report presents the results of 3 full-scale tests conducted at the Institute for Research in Construction, National Research Council of Canada on double stud party wall/floor joints. The assemblies were tested in a floor furnace using the CAN/ULC-S101-M89 temperature-time relationship. This study was part of a joint research project on the fire and sound flanking at the wall/floor joints in double stud wall assemblies.

Assemblies No. 1 and No. 2 were tested with various fire stop materials: semi-rigid glass and rock fibre insulation boards, sheet steel and Oriented Strand Board (OSB) placed between the joist headers, to investigate whether these materials will prevent flame spread into the upper storey cavity between studs for 15 min. Assembly No. 3 was tested, with no fire stop material in the space between the joist headers, to investigate the effect of the width of the vertical air space (12.7 mm, 25.4 mm and 38.1 mm) between insulated double-stud frames on flame spread to the upper storey cavity between studs.

Prepared by: M.A. Sultan, Y.P. Seguin, P. Leroux, Institute for Research in Construction, National Research Council. Prepared for Canada Mortgage and Housing Corporation ... et al. CMHC Project Officer: Jacques Rousseau. Ottawa: CMHC, 1997.

STATUS : Completed Report

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LE SINISTRE DE JUILLET 1996 AU SAGUENAY: CONSÉQUENCES SUR LA REDÉFINITION DE L'HABITAT

The intent of this research is to allow one to appreciate, based on a target population in the Saguenay region, the consequences of a natural disaster in the design of one's home and the role this plays in the various stages disaster victims go through when they are required to relocate involuntarily. In more specific terms, this research attempts to answer the following questions:

- What were the residential itineraries of families which were uprooted against their will as a result of the floods of July 1996?
- What modifications did those who were involuntarily located make to their homes?
- What mechanisms did these people resort to in order to integrate into their new communities?
- What decision-making strategies could be used to take into account the needs and the living experience of relocated persons?

The research strategy takes a qualitative approach which involves interviews with about forty persons or couples who lost their homes and all their personal possessions during the floods of July 1996. Two verification instruments are used to explain what has been observed - semi-directed interviews and fact sheets. The answers to the questions asked produced the following findings. In addition to the physical and psychological effects of the direct consequences of the disaster and the numerous related difficulties, several aspects of the victims' personal, family, professional and social lives changed - (a) residential itineraries (most victims relocated three or four times before taking up their current residence) were a source of major tension; (b) integration into new neighbourhoods was mainly achieved with the participation of family and friends, and the new neighbours were often left out of the process. According to the disaster victims, living in a new neighbourhood means a break or even mourning, e.g. "A separation from friends, the loss of a feeling of security, changes in lifestyle, financial constraints, etc.; (c) the loss of "this paradise (...) this great corner of the world" elicits a new definition of the housing which is marked by images or representations that are negative (feeling of strangeness, nostalgia, indebtedness, sentimental losses, etc.); (d) finally, disaster victims have some suggestions to pass on to others who suffer a similar fate to inform and guide them. They suggest that victims take a step back before they make any important decisions. If volunteers are required at all times to display an understanding and generous attitude, the various levels of government should reduce bureaucratic and administrative requirements. Another suggestion offered by disaster victims was to extend the period during which financial and psychological help would be provided.

Prepared by Danielle Maltais, Suzie Robichaud. CMHC Project Officer: Marcel Boily.

Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

STATUS : Completed Report

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CHARACTERIZATION OF AIR LEAKAGE, PRESSURE REGIMES AND RESULTANT AIR MOVEMENT IN HIGH-RISE RESIDENTIAL BUILDINGS

The purpose of this project is to undertake a field investigation of the ventilation and infiltration in a residential highrise building. CMHC, in cooperation with the Institute of Research in Construction, will monitor indoor-outdoor air pressure regimes in a highrise for a period of one year. Ventilation system performance will also be assessed. Pressure regime measurements, in conjunction with measured air leakage characteristics of selected assemblies, will be used to estimate real-time air movement across the building envelope. This information will add to the body of knowledge governing infiltration-ventilation regimes and resultant heat load calculations in buildings.

CMHC Project Officer : Duncan Hill

CIDN : 1934 0200005

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

CORROSION OF DOMESTIC OIL TANKS

The objective of this research project is to investigate the corrosion of domestic oil tanks. Based on the findings, a number of predictive/preventative maintenance methodologies will be developed. A further objective will be to recommend changes to the various codes and guidelines covering tank fabrication, system installation, maintenance, inspection procedures and product specification.

CMHC Project Officer : Silvio Plescia

CIDN : 2144 0200009

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

EVALUATION OF RESIDENTIAL FURNACE FILTERS

Forced air furnaces are a common Canadian heating system. Traditionally, filters placed in the circulating air ductwork were designed to protect the furnace and fans. Over the last several years, there has been increased emphasis on improving the filtration efficiency with the goal of reducing occupant exposure to respirable particulate.

This project tested the performance of different filters in actual houses, from disposable fiberglass to electrostatic precipitators. The contractor looked at how air filtration affects the levels of particulates (airborne dust) in housing, and at the production of ozone by electrostatic precipitators.

Analysis shows that good filters do remove particulates at rates that are close to their rated performance. For example, the most effective filter tested, an electrostatic precipitator, reduced the quantity of particulate in the air in the duct from 70% - 90 % in different tests. But, because particulate is constantly infiltrating the house and is being created by occupant activities, the tests showed that when this very good filter was in operation, the concentration of airborne particulate in the house air was reduced only 40%. All other filters tested, being less efficient, fell in the range of less than 40% reduction. As well, these filters only work when the furnace fan is on. If the fan is not run continuously, installing good filtration will be even less effective.

A more comprehensive dust-reduction program is necessary (e.g. reducing house air leakage, better and more frequent vacuuming, reducing house particulate sources, etc.) to make a significant reduction in house airborne particulate, rather than simply increasing furnace filter efficiency. Upgrading filters is only a partial solution.

Prepared by Dara Bowser, Bowser Technical Inc. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Don Fugler. CMHC, 1999. (Housing Technology Series)

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FIELD SURVEY OF HEAT RECOVERY VENTILATION SYSTEMS

Ventilation is one of the most important design issues of the 90's in the Canadian construction industry. Building codes promote the comfort and safety of occupants by ensuring fresh air is provided to new homes, and stale, contaminated air is exhausted outdoors. Increasingly, these code requirements are being satisfied by the use of packaged heat recovery ventilators (HRVs).

Given the increased reliance on HRVs for ventilation, several authorities expressed a desire to explore and assess the relationships between home design, mechanical ventilation system design, installation practices and occupant use of ventilation systems as they relate to the effectiveness of ventilation of the dwelling. In response to such concerns, Canada Mortgage and Housing Corporation engaged Buchan, Lawton, Parent Ltd to study the field performance of HRV ventilation systems.

The conclusions drawn from these results will make it possible to improve installation practices, HRV system performance, and occupant understanding of and interaction with their HRV system.

The project involved four phases: 1) inspections of 60 homes with HRV ventilation systems, 2) survey of the occupants of the 60 households to determine their understanding and usage of their HRV ventilation systems and a telephone survey of a further 15 households, 3) intensive performance testing of existing HRV ventilation systems, and 4) intensive performance testing of experimental HRV ventilation systems.

The methodology for Phases III and IV involved the use of a trace concentration of gas to assess air change rates. Sulphur Hexafluoride, an innocuous gas not found in household environments, was released at predetermined points throughout the house and mixed by mechanical means until similar concentrations were achieved throughout the house. By measuring the decay in the concentration of the gas, the apparent air change rates were derived. The operating conditions of the ventilation system and the locations of the sampling points had an impact on the extent to which the measurements reflected whole house ventilation rates, room-by-room ventilation rates, natural air change rates caused by forces other than mechanical ventilation systems, or other factors related to ventilation, such as short circuiting within rooms, and cross contamination.

The common types of HRV installations investigated under this study (fully ducted, simplified and extended) were capable of performing well. The majority of the HRV ventilation systems were operating and were perceived to be providing a benefit to the occupants of the houses. Far greater benefits were possible, however, and considerable improvements could be made in installation practice, system performance, occupant understanding and occupant interaction with their system.

Prepared by Buchan, Lawton, Parent Ltd (Toronto & Ottawa) and Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1998.

STATUS : Completed Report

AVAILABILITY : Canadian Housing Information Centre

Canada Mortgage and Housing Corporation

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International clients see page 9 for order instructions.

FIELD TESTS OF VENTILATION SYSTEMS DESIGNED TO MEET 1995 NBC

This study concerns new houses designed and built to provincial or municipal codes that require the 1995 National Building Code. Ventilation requirements in recent Canadian building codes have become more complex and problematic to builders. The ventilation design needs to balance fresh air and exhausting air, and to consider house depressurization factors. The research team performed air testing on forty-one new houses in the western provinces, the North, and the Maritimes to verify their compliance with code required ventilation. No houses complied with all appropriate codes and standards; many had dangerous levels of house depressurization.

The research findings are being disseminated throughout the builder, code official, and research communities in order to solicit solutions. A Task Group has been started under National Research Council. The contractor will test potentially compliant systems in three houses in Manitoba this fall.

CMHC Project Officer : Don Fugler

CIDN : 2062 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

HVAC SYSTEMS OF MID AND HIGH-RISE RESIDENTIAL BUILDINGS

An evaluation of the mechanical systems of 25 mid and high-rise residential buildings has been performed in order to determine the changes in design and installation practices required by the 1995 National Building and Energy Codes. Additionally, the performance of the mechanical ventilation systems has been assessed in 10 buildings in terms of design criteria, design procedures, system strategies and installed performance levels. The research found that air tends to move through apartment buildings more by accident than design. This is due to a lack of information on the environmental conditions and building physical characteristics that govern natural and mechanical air flow. Consequently, it is difficult to ensure that there is adequate fresh air delivery to any point in a building, given conventional mechanical air system design. This information will be used to produce advisory documents showing how to meet codes and improve system performance. Final report is in production.

CMHC Project Officer : Duncan Hill

CIDN : 1424 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

IDENTIFYING AND REMOVING POLLUTANTS FORM HEAT RECOVERY VENTILATORS

This study investigated the presence of allergens such as dust and molds in heat recovery ventilation systems and the duct work. It also looked at two different types of cleaning equipment and their ability to clean these pollutants from the rigid and flexible ductwork and heat recovery ventilator (HRV) cores in dedicated balanced supply and exhaust ventilation systems. Samples from the ductwork and cores of ten ventilation systems were tested for levels of dust and mold. The ductwork and cores were then cleaned using standard ductwork cleaning apparatus, then tested again to indicate the success of the cleaning process. All houses were tested for air and surface mold counts using an RCS air sampler and typical swab collection systems. Two of the ten houses were re-tested over a period of fifteen months. There were high mold counts on the surfaces of the supply air ducts. However, there was no correlation to house air mold counts, which were found to be inconclusive. It could not be determined whether airborne molds were considered a health risk in the houses as tested. It was also found that conventional equipment was not effective in cleaning the ductwork systems.

Prepared by Terry Watters, Sustainable Housing and Education Consultants Ltd. CMHC Project Officer: Don Fugler. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

STATUS : Completed Report

AVAILABILITY : Canadian Housing Information Centre

Canada Mortgage and Housing Corporation

700 Montreal Road

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International clients see page 9 for order instructions.

LOW TEMPERATURE HYDRONIC HEATING SYSTEMS

The objective of this project is to investigate low temperature hydronic systems (LTHS) as an energy option and identify additional information and action needed to assess, document, and appropriately advance LTHS.

CMHC Project Officer : Ken Ruest

CIDN : 1570 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

MONITORING A DUAL HEATING SYSTEM INSTALLATION

This research will monitor and assess the performance of a dual fuel heating system in an 89 suite apartment building. Originally, the building was heated with electric baseboards. The presence of natural gas fired boilers allowed the installation of hydronic radiant panels within apartments to shift the heating load from electricity to natural gas. Following the installation of the system, the energy consumption of the building was tracked for a one-year period. A report will be issued that describes the system and its potential to reduce energy costs.

CMHC Project Officer : *Duncan Hill*

CIDN : *1899 0200004*

Division : *Research Division*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

PART-LOAD AND FROSTING CONTROL FOR ROTARY ENERGY WHEELS USED IN RESIDENTIAL BUILDINGS

The objective of this research is to determine the performance of rotary energy wheels, also called enthalpy wheels, for ventilation air exchange in residential buildings while subjected to a wide range of operating conditions.

CMHC Project Officer : *Duncan Hill*

CIDN : *2007 0200001*

Division : *External Research Program
Research Division*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

RETROFITTING VENTILATION

This project is to examine how effectively ventilation can be retrofitted to existing houses, either as a standalone project or as part of a larger renovation. The research team will test the effectiveness of retrofitted ventilation systems in older homes and their effects on indoor air quality. It will also describe practical methods for installing ventilation equipment and ducting in older homes.

CMHC Project Officer : *Don Fugler*

CIDN : *2063 0200001*

Division : *Research Division*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

HEATING AND VENTILATION

REWRITING TEST STANDARD CAN/CGSB-149.10 - DETERMINATION OF THE AIRTIGHTNESS OF BUILDING ENVELOPES BY THE FAN DEPRESSURIZATION METHOD

The objective of this project is to re-write the airtightness test standard CAN/CGSB-149.10.

CMHC Project Officer : Don Fugler

CIDN : 1971 0200002

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

TO ASSESS THE PERFORMANCE OF THE LEBRETON FLATS DISTRICT HEATING SYSTEM

The Lebreton Flats district heating system, installed 20 years ago, is one of few examples of low temperature district heating systems in North America. The availability of fuel consumption and maintenance records for the system allows for an assessment of the performance of the system over the last 20 year period. It will also allow for a comparison of the district system with more conventional heating system options. Monitoring will be undertaken to assess the performance of the plant. Recommendations regarding system performance, potential upgrades and future operation, maintenance needs and other ownership/management arrangements will be made.

CMHC Project Officer : Duncan Hill

CIDN : 2134 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

ADVISORY DOCUMENT ON MECHANICAL AND ELECTRICAL SYSTEMS IN MULTI-UNIT RESIDENTIAL BUILDINGS

An advisory document on the design of energy conserving equipment and systems providing plumbing, heating, ventilation and air conditioning, lighting and power in multiple-unit buildings has been reviewed by practitioners. The system design and installation practices noted in the report are being modified to reflect their comments. An advisory document to recommend "good engineering practice" for designers, owners and consultants should be available in 1999.

CMHC Project Officer : Duncan Hill

CIDN : 1774 0300004

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

BC MOISTURE PROBLEMS - COMPUTER SIMULATIONS

This research will study, through the use of computer simulations using the WALLDRY computer program, the drying potential of various wall configurations and is intended to provide data to bolster recommendations to be incorporated in the "Best Practice Guide for the Coastal Area of British Columbia". The results of the work will also be used to guide in the development of the Envelope Drying Rate Analysis Project. As the cost of doing all the tests proposed is prohibitive, it was recommended that computer simulation WALLDRY be used to determine which walls might be more promising to test than others, potentially leading to a reduction in the cost of the test program.

CMHC Project Officer : Jacques Rousseau

CIDN : 1816 0300004

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

BC MOISTURE PROBLEMS - ENVELOPE DRYING RATES EXPERIMENT

Findings from the 'Survey of Building Envelope Failures in the Coastal Climate of British Columbia' revealed that the construction of walls with face seal or concealed barrier systems does not promote rapid drying of wall assemblies once the moisture has saturated the moisture barrier and passed into the sheathing. The solution to promote drying of the wall assembly has been to introduce an air cavity behind the claddings. The objective of this project is to identify, through laboratory work, a range of cavity and vent configurations which will provide wall drying capability characteristics necessary to deal with the coastal British Columbia climate. In addition to the vents, the effect of insulation, vapour barrier, type of building paper and type of cladding will be investigated.

CMHC Project Officer : Mark Salerno, Sylvio Plescia

CIDN : 1816 0300009

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

BC MOISTURE PROBLEMS - HYGROTHERMAL PERFORMANCE OF STUCCO

The project objectives are to develop fundamental and applied understanding of the hygrothermal performance of stucco based wall systems for Vancouver, B.C. weather conditions. The properties will be investigated through laboratory evaluation. The long term hygrothermal behaviour of the building envelope components will be simulated using the LATENITE computer program. The result of the work will guide the "Envelope Drying Rate Analysis" study. The work is being collaboratively funded with the NRC/Institute for Research in Construction and is part of the recently launched Consortium on Moisture Control Strategies of Wall Systems.

CMHC Project Officer : Jacques Rousseau, Mark Salerno

CIDN : 1816 0300007

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

BC MOISTURE PROBLEMS - QUALITY ASSURANCE PROTOCOL

The objective of this study was to produce a protocol which will form the baseline quality management system for the exterior envelope of 3 and 4 storey wood frame construction in British Columbia. The protocol deals with the conclusion and recommendations identified in the "Survey of Building Envelope Failure in the Coastal Climate of British Columbia". The protocol will also tie into the "Best Practice Guide for Wood Frame Construction in the Coastal Climate of British Columbia". The draft protocol has been reviewed and is being tested in a real project in order to refine it.

CMHC Project Officer : Jacques Rousseau, Mark Salerno **CIDN :** 1816 0300006
Division : Research Division **STATUS :** Ongoing Project
AVAILABILITY : Publication is not available

BC MOISTURE PROBLEMS - SMALL SCALE TESTING AND DEVELOPMENT PROTOCOL

This work results from the conclusions and recommendations of the "Survey of Building Failures in the Coastal Climate of British Columbia". The intent of this initial testing project was to give the industry some sense of what will or will not work and examine the sensitivity of the various systems to specific variables. The testing provided a relative comparison under a specific set of environmental conditions. Although the work did not provide a definitive solution, it did demonstrate that the drying potential due to diffusion in the coastal climatic environment was very small. The work has been used to develop the protocol for the "Envelope Drying Rate Analysis" which is currently underway to investigate other drying mechanisms. This project was funded in collaboration with the NRC/Institute for Research in Construction, the City of Vancouver, Van Maren Limited, Centreville Limited and Aquastap Limited.

CMHC Project Officer : Jacques Rousseau, Mark Salerno **CIDN :** 1816 0300005
Division : Research Division **STATUS :** Ongoing Project
AVAILABILITY : Publication is not available

BEST PRACTICE GUIDE - FIRE AND SOUND ASSEMBLIES FOR MULTI-FAMILY BUILDINGS

This document, targeted at designers of multi-family buildings, will provide the latest information on CMHC research into fire and sound partitions, floors, flanking, plumbing noise, etc. The document is being produced in collaboration with the NRC/IRC.

CMHC Project Officer : Ken Ruest **CIDN :** 1804 0300003
Division : Research Division **STATUS :** Ongoing Project
AVAILABILITY : Publication is not available

BEST PRACTICE GUIDE FOR EXTERIOR INSULATED FINISHED SYSTEMS (EIFS)

The purpose of this project is to undertake and complete the Best Practice Guide. The guide is intended for designers and will provide solutions to commonly found details in the building envelope design process, as it relates to EIFS.

CMHC Project Officer : Luis de Miguel

CIDN : 2047 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

CASE STUDIES FOR INNOVATIVE TECHNOLOGY AND SOLUTIONS IN SUCCESSFUL MULTI-FAMILY HOUSING

Successful innovative Canadian multi-family residential buildings are being identified and documented for future monitoring. Areas such as durable building envelope, energy savings, life-cycle costs and environmentally responsive solutions will be evaluated. One multi-family residential building, the Conservation Co-operative, was selected for evaluation and was presented at the Green Building Challenge in Vancouver in the Fall of 1998. Posters of several Canadian residential projects were prepared for the October GBC conference. The selected systems are the subject of illustrated case stories which also are available on the Research website www.cmhc-schl.gc.ca/research/highrise.

CMHC Project Officer : Sandra Marshall

CIDN : 1817 0300001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

CASE STUDY OF THE RENOVATION OF AN APARTMENT BUILDING WITH SOLID MASONRY WALLS

A 90 year old commercial building with solid masonry walls has been gutted and renovated into a residential building for low income single persons. The renovation involved the addition of thermal insulation to the building envelope, the application of stucco to the exterior of three of the four sides of the building, restoration to the front masonry facade, installation of a balanced mechanical ventilation system and a combination hydronic baseboard/radiant floor heating system. The building envelope is being monitored to provide an indication of its potential long-term performance. Energy use and indoor air quality will also be monitored in the renovated building to assess the strengths and weaknesses of the renovation strategy. A case study will be produced to document the work undertaken and the results of the performance monitoring.

CMHC Project Officer : Duncan Hill

CIDN : 1730 0300002

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

COMPARATIVE ANALYSIS OF RESIDENTIAL CONSTRUCTION IN SEATTLE, WA AND VANCOUVER, B.C.

This project has compared the differences in construction to determine if a similar cause of building envelope failure is occurring in the typical low rise multi-unit (3 to 4 storey) wood framed residential development built in the Seattle area. The study has demonstrated that similar problems are occurring in Seattle.

CMHC Project Officer : Jacques Rousseau

CIDN : 1569 0300003

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

CONTRIBUTION TO THE PREPARATION OF AN ANALYSIS OF OPERATING AND MAINTENANCE COSTS STUDY

The objective of this project is to obtain up-to-date and regional financial information on operating and maintenance costs for approximately 100 multiple housing projects, using year end financial statements.

CMHC Project Officer : Sandra Marshall

CIDN : 1561 0300003

Division : Research Division

STATUS : Completed

AVAILABILITY : Publication is not available

ENVIRONMENTAL IMPACT ASSESSMENT TOOLS FOR MULTI-UNIT HOUSING

This project will assess 6 different environmental assessment tools to determine their applicability to multi unit residential buildings. The best features and limitations of each tool will be identified and transmitted to the authors of each tool. Four innovative buildings will then be assessed by one of the tools. This work was presented to the Green Building Challenge '98 (GBC) Committee as part of CMHC's contribution to the development of the residential component of the Green Building Challenge overall evaluation criteria for buildings of all types. The GBC is an international conference on the performance assessment of buildings held in Vancouver October 1998. Further work will be done in 1999 to develop a comprehensive environmental impact assessment tool for highrise buildings, including the identification of related benchmarks, and the associated costs and savings from reducing environmental damage.

CMHC Project Officer : Cate Soroczan

CIDN : 1872 0200

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

EXPORTING CMHC'S TECHNICAL SEMINAR SERIES

Over the past fifteen years, CMHC has undertaken research work into the development of technologies for highrise buildings. The work could be marketable in the US and other countries where they are being faced with similar concerns regarding energy efficiency, airtightness, noise control and rain penetration control of the building envelope. CMHC's research activities into the building sciences were undertaken by Canadian consulting firms who have gained considerable knowledge that could also be marketed in other countries. A pilot series of seminars is being developed to be conducted in the USA in partnership with the Building Environmental Thermal Envelope Council with funding from the Dept. of Energy.

CMHC Project Officer : Jacques Rousseau

CIDN : 1928 0200

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

GOVERNOR'S ROAD AND SPENCER CREEK VILLAGE PROJECT, DUNDAS, ONTARIO

The purpose of this project was to carry out the CMHC Healthy Housing and IDEAS Challenge objectives on the Governor's Road and Spencer Creek Village project in Dundas, Ontario.

CMHC Project Officer : Sandra Marshall

CIDN : 0840 0309007

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

GUIDELINES FOR THE RETROFIT OF UNINSULATED MASONRY WALLS

In cooperation with NRC's Institute for Research in Construction, a project has been initiated to assess common forms of solid masonry walls in commercial and residential buildings and current energy retrofit strategies. Investigations of previously retrofitted walls are being performed to determine the impact on the durability of the building envelope.

CMHC Project Officer : Duncan Hill

CIDN : 1730 0300003

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication will not be published

HIGH-RISE APARTMENT REPAIR NEEDS ASSESSMENT IN THE FORMER CITIES OF TORONTO AND YORK

A representative sample of 63 multifamily rental buildings in Toronto have been audited in order to determine their condition. The buildings were examined to determine their durability, in areas such as health and fire safety, mechanical systems and the related repair costs. The project is a joint initiative with the City of Toronto. Preliminary results show the average repair costs to be \$7,474 over ten years, not including regular maintenance or interior finishes. For building envelope systems, complaints due to leaks rise from 12% in pre-60s construction to 45% in post-70s buildings.

CMHC Project Officer : Sandra Marshall

CIDN : 1537 0300001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

IDEAS HIGH-RISE CHALLENGE

The IDEAS Challenge is intended to demonstrate the benefits of innovative design and technology in the operation of high-rise residential buildings. The Challenge focuses on five aspects of building design: envelope durability, energy efficiency, indoor air quality, environmental conservation and accessibility. One project in Montreal is built and monitoring is being carried out. Acoustic details have been tested. Two booklets are available, one that describes the IDEAS Challenge and the features of the five finalist projects and another which is a "Better Building" guide to innovation in the design and construction of high-rise residential buildings. The design process of a building in Dundas, Ontario which is exploring the adaptation of the IDEAS Challenge goals and details of CMHC's Best Practice Guide, is being documented. Projects in Vancouver and Edmonton are also ongoing.

CMHC Project Officer : Sandra Marshall

CIDN : 0840 0300

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

MODELLING OF AIR/MOISTURE MOVEMENT AND DURABILITY PERFORMANCE OF RESIDENTIAL AND COMMERCIAL BUILDINGS

The purpose of this project is to develop knowledge to assess the impact of various wall designs, ventilation and indoor environment conditions on the durability and energy efficiency of new and retrofitted high-rise residential and commercial building systems.

CMHC Project Officer : Duncan Hill

CIDN : 1934 0200003

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

MONITORING INNOVATIVE MECHANICAL AND ELECTRICAL SYSTEMS

The innovative mechanical and electrical energy consuming and producing systems in high-rise housing at a recently completed housing project in Toronto, are being monitored. A gas-fired cogeneration system was installed that provides electricity and thermal heat to the building. The building's owners are concerned that the system is not performing in an economically viable manner. An extensive monitoring and performance assessment is underway to evaluate system performance. The cost of energy provided to the building by the cogeneration system in terms of fuel consumption, maintenance expenditures, avoided utility invoicing and other considerations will be assessed. The performance and cost of the cogeneration system will be compared to other alternative but more conventional options.

CMHC Project Officer : Duncan Hill

CIDN : 1260 0800001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

MONITORING THE RETROFIT OF A RESIDENTIAL HIGH-RISE BUILDING ENVELOPE

A case study of a 20 year old high-rise building in Toronto has been undertaken to document and monitor the performance of the retrofitted walls. In November 1997, an Exterior Insulating Finish System (EIFS) was installed over the precast block walls as part of an overall building renewal project. Instrumentation to monitor heat, air and moisture regimes within the wall sections was installed which is currently being monitored for one year to assess the performance of the retrofit strategy. Preliminary results indicate that the walls are performing in a satisfactory manner but an assessment of the full year's monitoring will be necessary to draw conclusions concerning the retrofit measure.

CMHC Project Officer : Duncan Hill

CIDN : 1602 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

OPERATING AND MAINTENANCE BOOKS FOR MECHANICAL AND ELECTRICAL SYSTEMS IN MULTI-UNIT BUILDINGS

Two publications, currently in 'draft' stage, on improving the operating performance of modern residential building systems have been developed. The first document, for owners and managers, links good operating practices with desirable investment strategies. The second, for building operating and maintenance staff, updates information on mechanical and electrical systems and incorporates preventative maintenance checklists for multi-unit residential buildings.

CMHC Project Officer : Jacques Rousseau

CIDN : 1774 0300004

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

PERFORMANCE MONITORING: BRICK VENEER/STEEL STUD (BV/SS) WALL SYSTEM: PHASE 4

Phase 4 of this study involves a fourth year (1997/98) of in-situ performance monitoring of a BV/SS wall system, with respect to air and moisture movements after the top vents in the brick veneer wall have been opened. The performance of a wall is being monitored using temperature, moisture and air pressure sensors connected to an automatic data logging system. Preliminary results indicate that the vent holes did not contribute to drying the wall but increased the moisture loading of the brick veneer. Even though the BV/SS wall system is typical of current practices and workmanship was satisfactory, the results of the study demonstrate that performance problems exist that may lead to significant distress over the long term. The more serious performance problems identified in this study are due to design weakness demonstrating the need to improve design and construction standards. Phase 1 & 2 reports are available from CMHC. The results of the Phase 3 research demonstrated no significant difference from Phase 1 and 2 and the Phase 4 draft report has been received.

CMHC Project Officer : Jacques Rousseau

CIDN : 0787 0300001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

RAIN PENETRATION CONTROL

This document, currently in the 'draft' stage, provides the latest information on controlling the penetration of rain into walls. It is based on CMHC's research and other information regarding rain penetration control. The work is being funded in collaboration with the American Architectural Manufacturers Association. A copy of the draft can be obtained from Jacques Rousseau.

CMHC Project Officer : Jacques Rousseau

CIDN : 1258 0300004

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

RAINSCREEN 2.1 COMPUTER PROGRAM

The RAINSCREEN program has been developed to assist in the design of rainscreen pressure equalized wall assemblies. A new version of the RAINSCREEN computer program, including a tutorial program and a manual that will be much more user-friendly has been produced and is available on the web at the following

address:<http://www.cmhc-schl.gc.ca/Research/HighRise/files/rainscreen.html>

CMHC Project Officer : Jacques Rousseau

CIDN : 1258 0300005

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

REMEDICATION OF MOISTURE TROUBLED WOOD FRAMED BUILDINGS IN THE COASTAL CLIMATE OF B.C.

This project will research and prepare diagnostics and recommended procedures for the cost effective remediation of leaking condominiums in the lower mainland of B.C. The project will develop a standard method of damage assessment, to develop a solutions tool which considers technical, code compliance, financial implications and practicality of repair. A document will also be prepared for property managers and for strata councils - on maintenance and repair issues. The project duration is expected to be one year.

CMHC Project Officer : Ken Ruest, Mark Salerno

CIDN : 2061 0200

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

REPAIR AND RETROFIT CASE STUDIES FOR MULTI-UNIT RESIDENTIAL BUILDINGS

CMHC is documenting repair and retrofit activities in multi-unit residential buildings. The first 30 case studies will document building characteristics, the type of problems that prompted the repairs and retrofits, costs, benefits, etc. A wide range of case studies will be included to reflect regional repair and retrofit priorities. The studies will be useful for other members of the multi-unit residential building industry to refer to when considering similar projects. An information template that can be used as a guideline for the type of information that should be extracted from a repair or retrofit project in a multi-unit residential building has been developed. CMHC is currently soliciting the building industry for case studies and will retain consultants to provide the necessary documentation. A compendium of case studies will be assembled and made available.

CMHC Project Officer : Luis de Miguel

CIDN : 1782 0300001-7

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

RESEARCHING THE ROLE THAT ISO 14001 (ENVIRONMENTAL MANAGEMENT SYSTEMS) CAN PLAY IN MULTI-UNIT RESIDENTIAL HOUSING MANAGEMENT

The purpose of this project is to identify whether or not the International Standard ISO 14001, "Environmental Management Systems - Specification with Guidance for Use" has a role to play in residential building management. If this research determines that ISO 14001 does have a role to play, the research will strive to identify the exact nature of that role.

CMHC Project Officer : *Silvio Plescia*

CIDN : *2144 0200007*

Division : *External Research Program*

STATUS : *Ongoing Project*

Research Division

AVAILABILITY : *Publication is not available*

REVISION TO MONITORING PROTOCOL

The purpose of this project is to rewrite the protocol in a more modular fashion; expand the monitoring protocol to include monitoring, interpretation of data; remove the original reference to the IDEAS Challenge Project; and revise graph data presentation.

CMHC Project Officer : *Jacques Rousseau*

CIDN : *0840 0306012*

Division : *Research Division*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

STUDY TO EVALUATE CAUSES OF MOISTURE PROBLEMS IN ALBERTA HOUSING

In partnership with the Alberta Housing Industry Technical Committee, this project is to investigate the alleged problem of moisture ingress into low-rise wood frame housing in Alberta. At the present time, industry opinion is divided on the source of moisture critical to the cause of reported water leakage incidents and this study will provide some clarity to the issue.

CMHC Project Officer : *Ken Ruest, Halayna Tataryn*

CIDN : *2066 0200001*

Division : *Research Division*

STATUS : *Ongoing Project*

Prairie Region Business Centre

AVAILABILITY : *Publication is not available*

TESTING OF DYNAMIC BUFFER ZONE (DBF) METHOD ON 312 CUMBERLAND STREET, OTTAWA

The purpose of this project is to test a Dynamic Buffer Zone (DBF) method in the air space behind the brick cladding on a building.

CMHC Project Officer : *Luis de Miguel*

CIDN : *0411 0305002*

Division : *Research Division*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

WIND-DRIVEN RAIN FOR THE GOVERNOR'S ROAD PROJECT

Continuing previous research, this project explores the impact of roof cornice design in providing protection from wind-driven rain at the top of a multi-family building in Dundas, Ontario in order to better optimize the roof design.

CMHC Project Officer : *Sandra Marshall*

CIDN : *1123 0300013*

Division : *Research Division*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

WOOD-FRAME ENVELOPES IN THE COASTAL CLIMATE OF BRITISH COLUMBIA. BEST PRACTICE GUIDE, BUILDING TECHNOLOGY

Building in BC's coastal climate has special challenges -- and this 256 page guide is the most up-to-date, authoritative information available to help meet those challenges. This guide provides the most comprehensive technical information on how to build to withstand the conditions of BC's coastal climate.

The guide is intended to provide guidance, primarily to designers, for the design of the building envelopes of multi-unit wood-frame buildings in the coastal climate zone of British Columbia. The guide should also be useful to the construction industry in general, encouraging an understanding of the behaviour and performance of building envelope assemblies. Much of the material in the guide may also be applicable to other climate zones and building types.

Although the guide is intended to reflect good practice in general, its primary focus is on the management of moisture, since moisture-related performance problems prompted this initiative. The guide therefore does not deal specifically with structural, acoustic or fire and safety issues that may also have an impact on the design of the building envelope.

The information in the guide includes behaviour of wood in construction, moisture source control strategies, heat flow mechanisms, typical envelope assembly characteristics, and materials for inclusion in specifications, quality assurance strategies, maintenance and renewal strategies and more than fifty-three state-of-the-art CAD details showing several air barrier strategies, all included on the companion CD-ROM.

Endorsed by the Canadian Wood Council (CWC) and the Building Envelope Research Consortium (BERC).

Prepared by RDH Building Engineering Limited in joint venture with Morrison Hershfield Limited. The two dimensional drawings were prepared by Hewitt Tan Kwasnicky Architects Inc. and the chapter on Behaviour of Wood was prepared by Don Onysko. Ottawa: Canada Mortgage and Housing Corporation, 1999.

Order number: NE2178 **Price: \$89.00 + GST and handling charges.

STATUS : Completed Report

AVAILABILITY : CMHC Information Products

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Toronto, Ontario M7Y 6E5

1-800-668-2642

Fax orders from Canada: 1-800-245-9274

International clients see page 9 for order instructions.

WOOD FRAME ENVELOPES. BEST PRACTICE GUIDE, BUILDING TECHNOLOGY

Designer, builders, building owners and managers who consult this guide should gain a general understanding of the principles and practical considerations of designing and constructing wood frame envelopes. The Guide emphasizes the best residential construction practice details and specifications used in design offices and on construction sites across Canada.

The information includes the behaviour of wood in construction, moisture control strategies, heat flow mechanisms, typical envelope assembly characteristics, components and materials for inclusion in specifications, quality assurance, maintenance and renewal strategies. More than 30 clearly drawn construction details on CD-ROM are easy to download into a CAD program. Metric and imperial measures, French and English in different layers.

Prepared for Canada Mortgage and Housing Corporation by Otto Bryden Erskine Martel Architects Inc., and subsequently by Otto and Erskine Architects Inc., in joint venture with Halsall Associates. The National Research Council of Canada, the Canadian Home Builders' Association, the Canadian Wood Council and the New Brunswick Home Builders' Association assisted in development of this book. Ottawa: Canada Mortgage and Housing Corporation, 1999.

Order number: NE6921 **Price: \$89.00 + GST and handling charges.

STATUS : Completed Report

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HOUSE CONSTRUCTION

ABOUT YOUR HOUSE 'LOG HOMES'

The object of this project is to draft an 'About Your House' document on Log Homes. The document will describe logistics, benefits, and new technologies in log home construction.

CMHC Project Officer : Don Fugler

CIDN : 1584 0300006

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

APPLICATION OF STRUCTURAL STEEL TO SINGLE-FAMILY RESIDENTIAL CONSTRUCTION

This study is an investigation of the use of structural steel in single-family residential construction, and an analysis of its applicability to Canada, taking into account technical requirements, cost-effectiveness, and sustainability.

With the rise of housing costs, global competition, and increasing environmental concerns, new systems and innovative uses of material are required to supplement the existing construction methods. Numerous studies have demonstrated the potential of steel for building and its advantage in terms of price, performance, and physical properties. Residential projects in steel are usually built with lightweight metal framing systems. Structural steel is seldom used, although it offers additional advantages in terms of performance, economy, flexibility, and speed of construction, as well as a wide availability of skills, trades, and experience from the commercial and industrial building sector.

The purpose of the study is to provide to decision-makers in the building industry a clear view of the possibilities offered by the application of structural steel to housing.

The 200-page report addresses the following topics:

- *steel and metal building systems in the context of housing;*
- *existing steel houses worldwide and in Canada;*
- *source of information for steel technology;*
- *compliance with building codes;*
- *Canadian steel suppliers and trades;*
- *prototype design of a steel house;*
- *steel house and sustainability.*

Prepared by Michel de Spot, Node Engineering Corp. CMHC Project Officer: Rob Duncan. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

STATUS : Completed Report

AVAILABILITY : Canadian Housing Information Centre
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International clients see page 9 for order instructions.

BUILDER'S WORKSHOP SERIES TRAINER'S MANUAL

The objective of this project was to revise and update the three remaining modules for inclusion in the Builder's Workshop Series Trainer's Manual, (i.e. Indoor Air Quality, Ventilation and Noise Control). The first four modules: Foundations, Wall Assemblies, Floor Assemblies, and Roof and Ceiling Assemblies have already been updated and are now in publishing phase. The IAQ, Ventilation and Noise Control training modules will be updated to coincide with the applicable information in "Building Solutions: A Problem Solving Guide for Builders and Renovators" and with current building codes and practices. These modules will be developed for presentation as two to three hour workshops, suitable for delivery at builder forums.

CMHC Project Officer : Darrel Smith

CIDN : 2130 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

CD-ROM VERSION OF THE CANADIAN WOOD-FRAME HOUSE CONSTRUCTION

The purpose of this project is to design and develop an internet based CD-ROM version of CMHC's "Canadian Wood-Frame House Construction" publication complete with a number of multimedia enhancements. It will also include the "Glossary of Housing Terms" with links from "CanadianWood-FrameHouse Construction", to serve as an illustrated glossary. It is anticipated to be available by mid 2000.

CMHC Project Officer : Darrel Smith

CIDN : 2123 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

COMPARATIVE STUDY OF ALTERNATIVE FRAMING AND BUILDING SYSTEMS FOR LOW-RISE HOUSING

The purpose of this project is to conduct a comparative study of the various alternative framing and building systems for low-rise housing in use today. These may include but not be limited to insulating concrete forms, straw bale, structural insulated panels, stack wall log and steel. The results of this study will be beneficial to those in the industry to help them make better informed decisions on choice of framing and building systems.

This study will take an inventory of and investigate the differences, benefits and limitations of the common and innovative building systems which are currently in use as compared to the typical wood-frame, stick-built construction of low-rise housing. It will consider the advantages and/or disadvantages of the various systems for use in remote areas as well as the potential for exporting to other countries. The study will examine all of the factors to be considered by a builder or homeowner to help them understand the differences between the available system choices so they may evaluate and select systems appropriate to their clients, house designs, trade practices and skills, and regions.

CMHC Project Officer : Darrel Smith

CIDN : 2119 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

CSA Z-824 STANDARD

The objective of this project is to take the existing draft of the CSA Z-824 Log Standard, rationalize the organization of the standard contents, and produce a draft for comment.

CMHC Project Officer : Rob Duncan

CIDN : 1811 0300001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

DEVELOPMENT OF COMMERCIALLY VIABLE CONCEPTS AND A DESIGN FOR A RESIDENTIAL FRAMING SYSTEM FOR A MONOCOQUE HOUSE

The purpose of this project is to undertake the development of commercially viable concepts and a design for a residential framing system for a monocoque house, to provide on-site guidance during the construction of prototypes of the design and to undertake post construction performance monitoring of the structures.

CMHC Project Officer : Rob Duncan

CIDN : 0657 0300001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

DEVELOPMENT OF GENERIC ENGINEERED DETAILS FOR THE CONSTRUCTION OF RESIDENTIAL TALL WALLS

Part 9 of the Alberta Building Code (1997) defines maximum allowable heights for exterior loadbearing walls based on their physical characteristics and the loads they support. The code, however, only specifies requirements for walls up to approximately 12 feet in height. Walls exceeding that height must be individually engineered. Significant time and expense could be saved through the availability of generic, engineered data which would allow builders in Alberta to select appropriate material and installation configurations for the tall wall requirements incorporated in their various projects. The purpose of this project was to develop such data.

Several general configurations were identified for analysis. These configurations included both solid walls and walls with varying window layouts. The range of wall dimensions was 7 to 16 feet in width by 10 to 20 feet in height. Some appurtenant components generally thought to provide additional support for tall walls were also included in the analysis. These included horizontal feature shelves, fireplaces located in corners and intra-span, interior partitions, and hip roofs.

Developmental work followed generally accepted principles of limit states design. Load carrying capacity and lateral deflection were defined as the governing limit states. The general design philosophy encompassed examination and classification of live loads throughout the province, and development of tables that link the load classification at a particular location to allowable tall wall characteristics for that location.

Two types of tall walls were developed. The first case - tables which identify the maximum widths of loadbearing walls of given height - was chosen as a means of addressing the option to construct tall walls in two vertical lifts. The second case - tables that identify the maximum height to which a loadbearing wall may be built - addresses the option of building tall walls with full height stud members. In the first case, stress and deflection due to wind loads constituted the governing conditions. Allowable deflection was set at $1/180$ of the width of the wall. In the second case, the combination of axial loading and bending moments caused by wind loading was considered, and either stresses or deflections governed the allowable height of the wall, depending on load combination.

The structural contributions of the appurtenant components studied were found to be minimal. From the generic perspective, whatever contributions could be afforded by these items would be lost to design allowances that would have to be made to compensate for the large number of variables associated with their installation. These variables include vertical and horizontal positions on the wall, materials used, and fastening methods used. Details describing these items would have to be intricate and the potential for another field variable - misapplication of intended specifications - would likely be introduced.

The tables developed within the scope of this project allow extension of the existing limits of the Alberta Building Code, 1997 edition. Table 9.23.10.1 of the code allows walls up to approximately 12 feet in height to be built without professional design input. Properly utilized, these tables allow the construction of walls up to approximately 25 feet in height (dependent upon load conditions) to be built in Alberta without professional design input. Some situations will exist where the tables do not address the requirements of a particular project or a particular project cannot comply with the conditions accompanying the use of the tables, and in these circumstances, individual professional design will remain a requirement.

HOUSE CONSTRUCTION

Prepared by Campbell Woodall & Associates Consulting Engineers Ltd. CMHC Project Manager:
Darrel R. Smith. Prepared for Research Division, Canada Mortgage and Housing Corporation.
Ottawa: CMHC, 1999.

STATUS : *Completed Report*

AVAILABILITY : *Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
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EASY-ACCESS THRESHOLDS TO BALCONIES: PROBLEMS AND POSSIBLE SOLUTIONS

The objective of this project is to demonstrate to architects, builders, developers and regulatory agencies the possibilities of producing easy-access thresholds to balconies in new or renovated residential buildings.

CMHC Project Officer : *Sandra Marshall*

CIDN : *1995 0200001*

Division : *External Research Program*

STATUS : *Ongoing Project*

Research Division

AVAILABILITY : *Publication is not available*

RESIDENTIAL DECONSTRUCTION MANUAL

The intent of this manual is to provide project managers (architects, engineers, interior designers, associated technicians and technologists, contract administrators, contractors, and site supervisors) involved in residential (single family and multi-unit) demolition with a reference tool to assist them in the economic feasibility assessment, planning and supervision of deconstruction.

Prepared by Derek Badger. CMHC Project Manager: Darrel R. Smith. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

STATUS : Completed Report

AVAILABILITY : Canadian Housing Information Centre

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TRANSLATION OF CANADIAN WOOD FRAME HOUSE CONSTRUCTION HANDBOOK 1998 AND THE GLOSSARY OF HOUSING TERMS 1997 REVISED EDITION INTO GERMAN

The purpose of this project is to translate the Canadian Wood Frame House Construction Handbook 1998 and the Glossary of Housing Terms 1997 revised edition into German.

CMHC Project Officer : Louis Musto

CIDN : 1973 0900001

Division : Canadian Housing Export Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

TRANSLATION OF CANADIAN WOOD FRAME HOUSE CONSTRUCTION HANDBOOK 1998 AND THE GLOSSARY OF HOUSING TERMS 1997 REVISED EDITION INTO RUSSIAN

The purpose of this project is to translate the Canadian Wood Frame House Construction Handbook 1998 and the Glossary of Housing Terms 1997 revised edition into Russian.

CMHC Project Officer : *Louis Musto*

CIDN : *1973 0900003*

Division : *Canadian Housing Export Centre*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

TRANSLATION OF CANADIAN WOOD FRAME HOUSE CONSTRUCTION HANDBOOK 1998 AND THE GLOSSARY OF HOUSING TERMS 1997 REVISED EDITION INTO SPANISH

The purpose of this project is to translate the Canadian Wood Frame House Construction Handbook 1998 and the Glossary of Housing Terms 1997 revised edition into Spanish.

CMHC Project Officer : *Louis Musto*

CIDN : *1973 0900002*

Division : *Canadian Housing Export Centre*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

USE OF CONVENTIONAL CROSS BRIDGING IN WOOD-I-JOIST FLOORS

The purpose of this project is to test the performance of wood-I joist floor systems with conventional and improved bridging under static and dynamic loads, to evaluate the effectiveness of conventional bridging in wood-I joist floor systems under static concentrated and dynamic load conditions and to evaluate the effect of the location of the bridging. The research will also investigate an improved method of attaching bridging to wood-I joists. The final report should be available late in 1999.

CMHC Project Officer : *Darrel Smith*

CIDN : *2144 0200002*

Division : *External Research Program*

STATUS : *Ongoing Project*

Research Division

AVAILABILITY : *Publication is not available*

TECHNOLOGY DISSEMINATION - A NEW APPROACH

Despite significant national efforts, the Canadian residential construction industry is often resistant to the introduction of cost saving technologies, due in part to most contractors having limited abilities to research, evaluate and introduce such advances. The goal of this External Research Program work is to devise an information dissemination technique which focuses on the process of innovation introduction rather than the innovations themselves. It is felt that by "reasonably demonstrating" the value of various innovations to subcontractors, there will subsequently be a "natural" spread to other projects as the subcontractors utilize their newly acquired cost-effective techniques to gain a competitive advantage.

CMHC Project Officer : Thomas Green

CIDN : 2144 0200016

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

HOUSING DESIGN

FLEXHOUSING DESIGN DEMONSTRATION

CMHC's FlexHousing is a new and innovative approach to home design, renovation and construction, able to adapt and convert affordably as people's lifestyles change. This exciting and practical approach to designing and building housing of all kinds - from single family, duplexes, multi-unit and even apartments allows residents to convert space to meet their changing needs. A 1996 CMHC design competition has spawned open houses of the winning designs and publications.

The Canadian Centre for Housing Technology at the National Research Council will feature the winning FlexHouse Design in its Information Centre, opening in October 1999. More information is available on the CMHC Home page or the new publication "FlexHousing - Homes That Adapt to Life's Changes.

CMHC Project Officer : Tom Parker

CIDN : 1389 0300

Division : Research Division

STATUS : Ongoing Project

FLEXHOUSING INFORMATION FOR THE CANADIAN HOME BUILDING INDUSTRY

To develop information materials and activities to encourage understanding and uptake of FlexHousing principles by the homebuilding industry. A "Professionals' Guide to FlexHousing" will be produced in fall 1999. A professionals' seminar will be developed to complement this information. FlexHousing displays at home shows will be undertaken, as well as work with selected municipalities on model bylaws to facilitate FlexHousing adoption.

CMHC Project Officer : Tom Parker

CIDN : 2144 0200011

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

LE PLEX RENOUVELÉ

This research report focuses on the Plex as an affordable and sustainable housing form. It traces its evolution and documents several historical types of it. The report appraises the Plex's advantages and proposes several design alternatives that would adapt it to the needs of contemporary households. The adapted Plex emerges as a flexible and economic form of housing most suitable for meeting the need for affordable housing. It is also an ideal form for infill and for more compact new neighbourhoods.

CMHC Project Officer : Fanis Grammenos

CIDN : 2096 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

MONTREAL: A GREAT TRADITION OF MEDIUM-DENSITY HOUSING

This project aims to highlight the adaptation processes of housing and building types throughout the various phases of the evolution of "plex" formulas (duplex, triplex, fourplex, fiveplex ...) in Montreal over four construction cycles between 1866 and 1935.

CMHC Project Officer : Mark Holzman

CIDN : 1455 0200001

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

HOUSING DESIGN

PASSIVE SOLAR HOUSE DESIGN PILOT WORKSHOP

In partnership with the Solar Energy Society of Canada (SESCI), and with support from NRCan, this project will assist SESCO to develop and present a pilot workshop on passive solar house design in 2000. The content of the workshop will be based primarily on the CMHC TAP the SUN publication. The pilot workshop will provide experience and feedback for the possible future development of a series of passive solar design workshops for presentation across Canada.

CMHC Project Officer : Thomas Green

CIDN : 2200 0200002

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

SINGLES HOUSING DESIGN STUDY AND DESIGN CHARETTE

A precedent study to review and evaluate existing singles housing design projects in Canada and the United States, and to identify the legislative barriers to developing new singles/SRO housing in Toronto. A design charette to generate detailed unit and building designs.

CMHC Project Officer : Anna Lenk

CIDN : 2183 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

INDOOR ENVIRONMENT

DEVELOPMENT OF MATERIAL EMISSION TEST STANDARDS

Improved test standards for emissions from caulks and sealants and urethane foam are currently being developed. These standards, currently in draft, are now being considered within the American Society for Testing and Materials (ASTM) process. NRC/IRC has developed a draft emission test standard for VOCs from pressed wood products. Revisions are being made to these draft standards in response to an ASTM committee ballot and will be resubmitted again this year, using new CMHC support funding, as requested by the Task Force on Material Emissions. It is anticipated that the ballot will be passed for inclusion of these standards into the ASTM process.

CMHC Project Officer : Virginia Salares

CIDN : 1244 0201003

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

FIELD VALIDATION OF AN IAQ MODEL FOR PREDICTING THE IMPACT OF MATERIAL EMISSIONS ON THE INDOOR AIR QUALITY OF A NEWLY CONSTRUCTED HOUSE

The objective of this project is to contribute to the field validation of an IAQ Model for predicting the impact of material emissions on the indoor air quality of a newly constructed house.

CMHC Project Officer : Virginia Salares

CIDN : 2110 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

GUIDE TO MECHANICAL EQUIPMENT FOR CLEAN INDOOR ENVIRONMENTS

Complementing the "Building Materials for the Environmentally Hypersensitive", this publication deals with heating, ventilating, air and water purification equipment for housing requiring special attention to air quality. The document is a reference guide for selecting new mechanical equipment for new construction or retrofits. The document includes discussions of the applicability of the equipment to environmentally hypersensitive individuals. The guide will be available in winter 2000.

CMHC Project Officer : Virginia Salares

CIDN : 1031 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

INDOOR AIR POLLUTION FROM ATTACHED GARAGES

CMHC is contributing to a Health Canada/Environment Canada project investigating the infiltration of garage-based pollutants into houses. Twenty-five Ottawa houses have been tested to determine the leakage area between the house and the attached garage. Pressure differentials were recorded and pressure testing was repeated during the winter months. The current work includes modeling of the IAQ implications and monitoring of pollutant entry when the garage is occupied by a "calibrated" car. So far, modeling has not been very successful. Further field testing took place in the winter of 1998/99. Health Canada will be publishing the project reports.

CMHC Project Officer : Don Fugler

CIDN : 1910 0200002

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

INDOOR AIR QUALITY TRAINING PROGRAM

A program to train residential indoor air quality problem investigators has been developed. The program consists of a three-day course, followed by a field training phase. Candidates for the program should have some expertise in building science and mechanical systems. A one-day seminar, the "Let's Clear the Air" seminar, is a prerequisite to the three-day course. Those who participated in the courses delivered in 1998/1999 have either completed or are completing their field training. A number of courses are planned for the next twelve months.

CMHC Project Officer : Virginia Salares

CIDN : 1623 0300017

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

PRINCE EDWARD ISLAND BIRTH COHORT STUDY OF MOLD IN HOMES

This joint study between CMHC, Carleton University, Health Canada and others will ultimately look at several hundred homes in Prince Edward Island to determine the biological exposure, house performance parameters and energy use characteristics of a statistically-representative set of houses occupied by newborn babies. Part of the study will follow the health of these babies to determine the degree to which damp and moldy houses result in increased infant health problems. The second year of the study has been completed. Indications are of a high incidence of health problems and high levels of moisture and mold in the houses. Data is being analysed.

CMHC Project Officer : Ken Ruest

CIDN : 1618 0300001- 2

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

STUDY OF HOUSE RETURN AIR SYSTEMS USING FLOOR JOIST SPACES

Research was conducted on air in houses that is distributed through the ducting system consisting of supply ducts and a return air plenum. Floor joist spaces are being used as return plenums in new construction and this study characterizes the indoor air in a number of houses with return air plenums made of all metal, combinations of metal, solid wood, plywood or oriented strand board. A Research Highlight sheet is being prepared.

CMHC Project Officer : Virginia Salares

CIDN : 1704 0300001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

STUDY ON THE EFFECT OF CONTROLLING THE HOME ENVIRONMENT ON ASTHMA

Six houses having one or more individuals suffering from asthma and in which the occupant's symptoms are linked to the house were inspected following the CMHC Residential IAQ Investigation Protocol. All houses were found to be severely moldy. The houses were subjected to tests for various indoor air parameters - CO₂, VOC's, dust mite allergens and molds. Mold tests confirmed the inspection findings. Five of the homeowners proceeded with a remediation. Compliance with recommendations of the study varied from partial to full. The health status of the asthmatic occupants was monitored during the study. Health improvement of the occupants correlated qualitatively with the degree of improvement of the air quality of the houses.

CMHC Project Officer : Virginia Salares

CIDN : 1621 0300002

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

SUPPORT FOR THE CONSORTIUM FOR MATERIAL EMISSIONS AND INDOOR AIR QUALITY MODELING

CMHC is an active supporting member on the steering committee and technical committee of a consortium established by the National Research Council, Institute for Research in Construction to develop protocols for testing materials and furnishings and for modeling the impact of those emissions on indoor air quality. Funds are being used to increase the database of materials tested to the new standards, in a house being built on the NRC campus.

CMHC Project Officer : Virginia Salares

CIDN : 1244 0200004

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

INDOOR ENVIRONMENT

TOWARD THE USE OF VOLUNTARY INITIATIVES FOR ACHIEVING HEALTHY INDOOR ENVIRONMENTS IN CANADA

CMHC is participating in this partnership initiative developed and led by Pollution Probe. The objective of this project is to establish the current state of regulation of the indoor environment - residential, commercial and institutional - in Canada and to identify barriers and approaches to enabling the promotion and achievement of healthy indoor environments. The project will review and analyse existing regulatory and voluntary programs which have an impact on the indoor environment, both in Canada and internationally. The project scope will cover four distinct areas - buildings, products, services and processes, and seek to identify barriers to the creation of healthier indoor environments, gaps in present knowledge, and opportunities for voluntary initiatives. Through consultation with industry, government and other key stakeholders, the most instructive initiatives will be evaluated to identify key success factors and for their potential as voluntary initiatives which could compliment and/or supplement existing regulatory measures.

CMHC Project Officer : Thomas Green

CIDN : 2106 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

LIGHTING

TESTING THE ADEQUACY OF RESIDENTIAL LIGHTING IN A CARE CENTRE: NEW AGE-ADJUSTED NORTH AMERICAN ILLUMINATION STANDARDS

The objective of this research is to undertake a field study on the effectiveness of lighting in two residential centres with remarkably different lighting levels.

CMHC Project Officer : Virginia Salares

CIDN : 2020 0200001

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

COMPARISON OF THE NATIONAL BUILDING CODE, CAN/CSA-Z240 MH AND HUD PART 3280 MOBILE HOME

In Canada, mobile homes are usually built to the CAN/CSA-Z240 MH standard, (Z240). The National Building Code, (NBC), forms the basis for regulating all site-built housing. In the United States, the mobile home industry operates under the Housing and Urban Development (HUD) code. The MHI of Canada (MHIC) has suggested that there may be situations where the NBC and its provincial equivalents or the Z240 standard have more stringent requirements than are required for occupant health and safety. MHIC also believes that there may be other approaches to the construction of housing that will deliver an equivalent unit of housing but at a reduced cost. CMHC, in association with MHI Canada and the Canadian Manufactured Housing Institute (CMHI), is undertaking a comparative study of practices under the three different approaches to examine if there are non-health and safety related code/standard differences that affect production costs.

CMHC Project Officer : Doug Pollard

CIDN : 1939 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

CONTRIBUTION TO DEVELOP A MULTILINGUAL DIRECTORY OF CANADIAN MANUFACTURED HOUSING COMPANIES

The objective of this project is to develop a multilingual directory of Canadian manufactured housing companies.

CMHC Project Officer : Louis Musto

CIDN : 2098 0900001

Division : Canadian Housing Export Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

LAND USE ISSUES IMPEDING THE PROVISION OF AFFORDABLE HOUSING WITH MOBILE HOMES

The study will summarize the manufactured (mobile) home legislative environment across the U.S. and Canada, identify legislative and land use impediments blocking improved market share on the part of the Canadian industry, analyse the relevance of the pro-active U.S legislative environment as a paradigm for Canadian legislative reform and develop suggestions for manufactured home land use and legislative development in Canada.

CMHC Project Officer : Doug Pollard

CIDN : 2154 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

MANUFACTURED HOUSING

MANUFACTURED HOUSING CONSULTANTS' TRAINING PROGRAM

The objective of this partnership project with the Canadian Manufactured Housing Institute is to develop and pilot a training program for retailers in the manufactured housing industry. This training will provide retailers with the skills, tools and knowledge on the technical, financial, regulatory and other aspects of their industry to better serve their clients effectively and professionally. CMHI will be responsible for overseeing the development and translation of the training material and delivery of the two-day pilot workshop session.

CMHC Project Officer : Darrel Smith

CIDN : 2196 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

MOISTURE AND MOLD

FIELD TESTING OF MOISTURE IN STRAW BALE HOUSES

Straw bale construction is an innovative construction technique that is gaining popularity, particularly for rural houses. While these structures seem to be working well in the dry American southwest, the birthplace of the straw bale housing movement, it is unclear how well they will withstand extended periods of cold and damp conditions. The first set of tests looked at three small local investigations of straw bale house moisture content: one in several houses in Alberta/BC, one in older straw bale homes in the Gatineau area north of Hull, Québec and one in several houses in Nova Scotia. Reports are available from CMHC on the Gatineau and Nova Scotia sites, and from the CMHC project manager on the Alberta testing. Several of the houses showed high levels of straw moisture, particularly when probes were located near the exterior walls. Further monitoring and analysis is underway in both laboratory and test houses (listed as separate projects) to determine whether these occurrences will jeopardize the longevity of the straw.

CMHC Project Officer : Don Fugler

CIDN : 1867 030002,4

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : See above

GUIDELINES FOR MOISTURE MANAGEMENT IN EXTERIOR WALL SYSTEMS

The purpose of this project is to contribute to the development of guidelines for moisture management strategies for exterior wall systems to meet user requirements of long-term performance and durability for the wide range of climate zones across North America.

CMHC Project Officer : *Silvio Plescia*

CIDN : *2199 0200001*

Division : *Research Division*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

MEASUREMENT OF THE HYGROTHERMAL PROPERTIES OF PLASTER AND STUCCO FOR STRAWBALE BUILDINGS

The objective of this project is to characterize the moisture performance of plaster and stucco over straw bales.

CMHC Project Officer : *Don Fugler*

CIDN : *1867 0300007*

Division : *Research Division*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

MONITORING OF MOISTURE CONTENT OF STRAW BALE HOUSE WALLS AT THE EXTERIOR STUCCO

The purpose of this project is to monitor the moisture content of straw bale walls at the exterior stucco in 8 to 10 houses.

CMHC Project Officer : *Don Fugler*

CIDN : *1867 0300005*

Division : *Research Division*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

MONITORING OF MOISTURE CONTENT OF STRAW BALE HOUSE WALLS AT THE EXTERIOR STUCCO

The purpose of this project is to monitor the moisture content of straw bale walls at the exterior stucco in four houses.

CMHC Project Officer : *Don Fugler*

CIDN : *1867 0300006*

Division : *Research Division*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

PERFORMANCE EVALUATION OF WATER REPELLENTS FOR ABOVE GRADE MASONRY

The objective of this project is to evaluate the performance of various water repellents for above grade masonry on a comparative basis and develop practical methods to evaluate their effectiveness. This evaluation will be based on lab analysis and field testing as well as a literature review to find available information on water repellent performance. The initial part of this study, Phase I will be conducted under the CMHC External Research Program and will examine the issue of water infiltration while Phase II will examine exfiltration.

CMHC Project Officer : Jacques Rousseau

CIDN : 1696 0300002

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

RAIN PENETRATION CONTROL SEMINAR

Water penetration is a frequent, recurring problem for building owners, leading to damage of building components, interior finishes and building contents. It frequently leads to high repair costs and possible litigation. Over the past few years, research undertaken by CMHC, has contributed to the understanding and the prevention of rain penetration. In particular the pressure-equalized rainscreen has been applied and refined. In this seminar the causes of rain penetration will be examined. The results of CMHC research will be presented, along with design features and practical details, which will help prevent rain penetration in a variety of wall types. This full day seminar is targeted to architects, engineers, specifiers, builders, developers and building owners concerned about rain penetration and how to prevent it. The seminars will be presented in Toronto, Winnipeg, Edmonton, Vancouver, Montreal and Quebec City. This seminar was developed in cooperation with the Canadian Masonry Association, the Canadian Precast Concrete Institute and the Exterior Insulated Finish Systems (EIFS), curtain wall and steel manufacturers.

CMHC Project Officer : Jacques Rousseau

CIDN : 0838 0303005

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication will not be published

RE-INSULATION OF EXISTING FLAT-ROOF MULTI-FAMILY BUILDINGS IN QUÉBEC

A joint project with Hydro Québec to examine ways of re-insulating low-rise multi-family buildings for energy efficiency, without causing moisture problems in the attic. Field testing was complete in early summer 1997. A final report was prepared. Hydro Quebec has not yet released it to the public.

CMHC Project Officer : Don Fugler

CIDN : 1377 0801001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

MOISTURE AND MOLD

STUDY OF RECURRING MOLD PROBLEMS ON THE ROSEAU RESERVE IN MANITOBA: PHASE TWO

The first phase of the project dealt with an investigation of eight houses on the Roseau River Reserve. Some of these houses had been remediated following the flood in 1997. Moisture problems were of a chronic nature, not directly related to flooding. Remediation and clean-up was found to be ineffective. This report is available.

The second phase of the project consists of developing an information kit for First Nations. The kit will assist First Nations to recognize when there is a mold problem and to take the necessary steps to deal with the problem. The report will be available in winter, 2000.

CMHC Project Officer : Virginia Salares

CIDN : 2036 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

NORTHERN HOUSING

FOUNDATION SYSTEMS FOR USE IN PERMAFROST AREAS

The purpose of this project is to conduct a study on foundation systems for use in Northern permafrost and intermittent permafrost areas. The study will assemble, document and analyse all data possible from literature searches and from the field on all known foundation systems used in the north. The final report will include a decision making tree to enable communities, homeowners, builders and renovators to make informed and appropriate choices in foundation systems.

CMHC Project Officer : Darrel Smith

CIDN : 2133 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

INNOVATIVE FOUNDATIONS, HEATING AND VENTILATION

This R&D&C (research, development, commercialization) project and first stage monitoring is complete and a report due before the end of 1998. CMHC, Yukon Housing Corporation (YHC) and Yukon Energy partnered in building two research/demonstration houses in Dawson City, Yukon. This work is a continuation of previous successes in R&D&C of the space frame foundation technology now being exported to Alaska. The thrust of the current foundation work is to reduce cost, develop a technology that can be locally manufactured and reduce the height of the crawl space.

A torque tube HSS steel section is under one house. The other house will be an extension of the sheet metal reinforced plywood monocoque technology resting on three bearing points. Lots of ground movement has been reported so the test site is proving to be a good demonstration. After a review of northern and remote technology, the heating and ventilation systems incorporate and optimize energy efficiency, minimal equipment and sustainable ventilation operation. Construction is complete and the houses are occupied. Commissioning of the project was a large task and the systems appear to be running efficiently at about half the energy consumption of a typical northern house. The mechanical technology was used on another YHC project at substantial capital savings and with some modifications appears to be the technology of choice. Work is underway to develop a more cost effective and simple foundation system.

CMHC Project Officer : Rob Duncan

CIDN : 1676 0300001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

NORTH WEB-SITE

The purpose of this partnership project was to design, establish and maintain a dedicated NoRTH Web-Site for a two year period. The project partners are CMHC, Alaska Housing and Finance Corporation, and Yukon College. The web-site includes relevant technical information such as factsheets of research reports and the Frostline newsletter. It also includes discussion groups to provide a means of ongoing and current communication. The web-site has links to other relevant web-sites and can be visited at www.NoRTH-RTHN.org. The web site is updated with new articles and factsheets from time to time.

CMHC Project Officer : Darrel Smith

CIDN : 1886 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication will not be published

HEALTHY HOUSING RENOVATION PLANNER: RENOVATE THE HEALTHY WAY

The "Healthy Housing Renovation Planner" is a step-by-step workbook to planning a healthy renovation.

Chapter One explains the links between your home, your health and the environment. It presents the key principles of Healthy Housing - contributing to occupant health, reducing energy consumption, conserving natural resources, minimizing environmental effects and balancing cost and practicality.

Chapter Two discusses the health effects of indoor air quality, with special attention to environmental hypersensitivities. A Home Health Checklist guides you through your home to help you identify sources of air quality problems - and solutions to them.

Chapter Three discusses the importance of up-front planning, walking you through the things you should think about before you begin your project. It describes the "house as a system", how you can renovate according to Healthy Housing principles and how you can get the most for your renovation dollar. Chapter Three will help you determine whether you have the skills and the time to do the job yourself. If you decide to hire a professional, Chapter Three gives you the information you need to choose the renovator who is best for you. The Chapter also discusses the critical importance of a written contract, insurance, building codes and by-laws and ways to minimize inconvenience while a project is under way.

The rest of the Renovation Planner deals with typical renovations, both large and small. In each chapter, you'll find several steps to help you plan a healthy and affordable project. Each chapter focuses on key issues involved in the renovation project: taking stock of the part of the house to renovate, evaluating options and strategies for making changes, and making a plan.

There are charts and checklists throughout the Renovation Planner so you can record your observations and your choices. Project planning worksheets help you assemble all the parts of the puzzle in one place. Lists of publications provide you with additional information on the subjects discussed.

Ottawa: Canada Mortgage and Housing Corporation, 1999. 320 pages.

Order number: NE2172 **Price: \$34.95 + GST and handling charges.

STATUS : *Completed Report*

AVAILABILITY : *CMHC Information Products*

P.O. Box 35005

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International clients see page 9 for order instructions.

HOW HEALTHY IS YOUR HOUSE: CMHC HOMEOWNER'S AND HOMEBUYER'S CHECKLIST FOR MAINTENANCE AND REPAIR

The current CMHC's Homeowner's and Homebuyer's: Inspection Checklist for Maintenance and Repair is being revised to both update and include a Healthy Housing evaluation "tool". It will provide homeowners and homebuyers with a pre-purchase or pre-renovation guide for performing an inspection on their house. Physical condition, IAQ, energy and environmental and maintenance and repair information will be included in the document. It will be beneficial in enabling consumers to make more informed decisions prior to hiring the assistance of a private home inspector should the need arise. This advisory document will be available early in 2000.

CMHC Project Officer : Darrel Smith

CIDN : 1901 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

RENOVATION OF GENERIC HOUSING STYLES - POST-WAR ONE-AND-A-HALF STOREY

The objective of this project is to provide consumer information on typical approaches to the repair and renovation of post-war one-and-a-half storey houses. Criteria for these approaches will include occupant lifestyle and needs, structural and maintenance requirements, "Healthy Housing" improvements (including environmental and energy-efficiency), and the impact on home equity and resale value. CMHC is preparing the document for publication in late 1999.

CMHC Project Officer : Don Fugler

CIDN : 1430 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

RENOVATOR TRAINING IN CANADA: AN EVALUATION AND SITUATION REPORT

The purpose of this project was to investigate the current situation with respect to renovation contractor training in Canada. A situation report was produced to determine who else is providing training for the residential construction industry with a focus on the renovator. Other issues related to this include marketing, financing, existing materials, relationship to certification, native initiatives, and options for delivery that reach beyond current CHBA membership, (i.e.: community colleges, private firms, etc.). The format and method of delivery was also researched (i.e.: five day, correspondence, computer-based, etc.). Recommendations presented in the study have been reviewed with industry and options for their implementation are being considered.

STATUS : Completed

AVAILABILITY : Publication will not be published

THE CANADIAN ASSOCIATION OF HOME AND PROPERTY INSPECTORS INITIATIVE

CMHC is assisting the private home inspection industry in Canada establish a minimum national standard of performance. The Canadian Association of Home and Property Inspectors (CAHPI) is a newly formed national association comprising a number of national and provincial home inspection associations, including some of the major franchises, and a number of independent inspection firms. CAHPI currently represents over 600 private home inspectors, but it is anticipated that other, non-affiliated private home inspectors will increase this number in the future. Concluding formal agreements with associations and establishing future national requirements are currently in progress. A CAHPI Board has been established and is setting-up and determining the responsibilities of the various committees such as, By-Laws, Accreditation and Certification, Strategic Relations, Education, Standard of Practice and Code of Ethics, and Discipline. CAHPI is working with the Alliance of Canadian Building Officials Association (ACBOA), which represents public building officials across the country, to submit a joint proposal to Human Resources and Development Canada requesting assistance to undertake an occupational skills analysis for both sectors of this industry.

CMHC Project Officer : Darrel Smith

CIDN : 1962 0200002

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

THE CANADIAN RENOVATION INDUSTRY AND THE INTERNET: USAGE PATTERNS, 1998-2001

The objective of this project is to survey renovators about their use of e-mail, web-sites, and interactive online communications.

CMHC Project Officer : Darrel Smith

CIDN : 2015 0200001

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

ACTION PLAN FOR REDUCING GREENHOUSE GASES IN RURAL COMMUNITIES

The purpose of this project is to prepare an integrated planning strategy that would provide guidance for rural municipalities across Canada facing the challenges of developing action plans for achieving Kyoto targets for reducing greenhouse gas (GHG) emissions. A rural Canadian community that will be developing an action plan for reducing GHGs will be selected for study. Funding will be directed to documenting the development of the action plan to ensure that the appropriate actions are considered, implemented, monitored and the results disseminated. The objective is to provide an innovative, comprehensive planning approach for rural communities that integrates transportation planning, land use planning, new housing and retrofits, waste management, economic development and the regulatory environment.

CMHC Project Officer : Susan Fisher

CIDN : 2105 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

CENTRE iSci: PARTICIPATION AND HOUSING EXHIBIT IN THE MONTREAL INTERACTIVE SCIENCE CENTRE AT THE VIEUX PORT

CMHC is participating in an Interactive Science Centre (Centre iSci) which will be created as part of the restoration of the Old Port of Montreal and will open in May 2000. The Centre's exposition of the science and technology of twelve industrial sectors will expose the visitor to the concepts, potential and challenges of each sector through highly interactive exhibits, multimedia displays and electronic connections to other national and international resources. Its goal is to foster creative and curious attitudes in the visitors, provide knowledge of natural processes and principles underlying each sector and present issues of importance to the next generation to improve their ability to seize the opportunities of the future. The theme of CMHC's participation and exhibition in the Habitat sector will be Healthy Housing and sustainable design. Links will also be made to other represented sectors which have implications for housing such as transportation, communication and medicine.

CMHC Project Officer : Thomas Green

CIDN : 2148 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

COMPARISON OF COSTS AND RESOURCE-EFFICIENCY OF SEVEN RESIDENTIAL LANDSCAPE OPTIONS

This research study is to quantify and compare the annual horticultural inputs (i.e. materials), time, costs and environmental impacts associated with maintaining seven different landscape types. After annual inputs are determined, the capital and life-cycle costs for a typical residential lot will also be calculated. The seven landscape types will include (in post-establishment growth states): wildflower meadow/prairie; naturalized woodland/shade garden; xeriscape; lawn area with hardy, low maintenance species; manicured lawn with conventional species; ornamental shrubs and trees; and annuals and perennial borders. The study will assess the potential environmental impacts of each option as well as their aesthetic and functional implications. In addition, potential benefits, such as wildlife habitat, bio-diversity and reduced storm water run-off will be identified and quantified. The final product will be a publication intended for municipal decision makers, advisors in planning and environmental management departments, homeowners and property managers. It will show how they can save resources, reduce environmental impacts, as well as save money and time through reductions in horticultural inputs.

CMHC Project Officer : Susan Fisher

CIDN : 1976 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

CONSTRUCTION RESOURCE MANAGEMENT COURSE - PHASE II

A private and public sector consortium has been established to develop a methodology for assisting industry to better understand, control and reduce the levels of construction, renovation and demolition (CRD) waste. To date, the partners include Industry Canada, Canada Mortgage and Housing Corporation, Alberta Environmental Protection, NWT Department of Resources, and PCL Constructors Canada Inc. Phase I was the development of a CRD training course in hard copy. The course provides practical and comprehensive information on resource management issues in the Canadian CRD industry. It is intended for project managers which include, but are not limited to: engineers, architects and CRD contractors. Phase II will consist of an Internet based CRD project management course that will: provide current resource management information and case-specific solutions; contribute to the development of standard managerial practice; promote widespread communication of the best resource recovery techniques, contribute to economic growth and job creation; promote long-term behavioural change; and help industry associations and government departments meet mandated environmental targets. The project is planned for completion in 2000.

CMHC Project Officer : Darrel Smith

CIDN : 2032 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

DEMONSTRATION OF HEALTHY HOUSING ON RESERVE

This project formerly reported as "Water and Sewage Disposal in Northern and Remote Locations" will now form part of the Northern Healthy Housing initiative. The objectives are to support the design, construction and demonstration of eight on-reserve Healthy Houses in Quebec, Ontario, Manitoba and the Northwest Territories, during 1999-2000. This initiative will demonstrate alternative Healthy Housing designs with features appropriate for remote communities. Alternatives to conventional energy and water supply and sewage disposal infrastructure will be researched, including a prototype HUM (Heating and Utilities Module) that can serve a single house or a group of houses. The design of several houses is about to be completed (bungalow, one-and-a-half storey house), and working groups from the community will review the process. Construction will commence in the spring of 1999, with the public demonstration beginning in the fall of 1999. The houses will be built by locally trained trades and specialists. A CMHC report will be produced detailing the costs and benefits of the houses, designs and systems upon completion of the project.

CMHC Project Officer : *Chris Ives*

CIDN : *1969 0200001-2*

Division : *Research Division*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

DESIGN AND TEST OF A PROTOTYPE UTILITIES MODULE

The objective of this project is to design and test a prototype utilities module (with interfaces suitable for hookup to a demonstration Healthy House in the First Nation community of Eagle Lake, Ontario).

CMHC Project Officer : *Chris Ives*

CIDN : *2156 0200001*

Division : *Research Division*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

HEALTHY HOUSING SEMINAR

A two and a half hour consumer Healthy Housing seminar, with a renovation focus, has been developed and packaged for delivery. The material was based on existing material produced by the CMHC Ontario and British Columbia Regional offices. It was also updated to include recent research and to give it a national scope. Examples of case studies were included by incorporating material from the 1994 and 1996 Renovation Demonstration projects. CMHC is currently negotiating a partnership with the building supply industry for delivery of these seminars. The seminars are being offered now in Quebec in partnership with Reno Depot. They will be held in other parts of Canada starting in the fall/winter of 1999/2000. Presenters will be from industry and the training staff of CMHC's retail partners.

A condensed 30-minute presentation of the Healthy Housing Seminar was also produced. This material can be used at home builder association meetings, various industry shows and conferences and also in the preparation of background documents.

CMHC Project Officer : Darrel Smith

CIDN : 1906 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication will not be published

JOINT RESEARCH BETWEEN CMHC AND KHI TO DEVELOP SUSTAINABLE PLANNING AND CONSTRUCTION GUIDELINES FOR KOREAN COUNTRY STYLE HOUSING DEVELOPMENT

The purpose of this project is to develop sustainable site planning and construction guidelines through a specific site near Seoul, Korea.

CMHC Project Officer : Jay Thakar

Division : Canadian Housing Export Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

LANDSCAPE CASE STUDY ARTICLES: DEVELOPMENT OF CONSUMER INFORMATION MATERIALS ON SUSTAINABLE COMMUNITY PLANNING

The purpose of this project is to develop a series of articles highlighting homeowners with resource-efficient, low-maintenance landscapes to encourage readers to consider adopting sustainable and time saving alternatives. Three articles will be published in community newspapers in each of Canada's five regions.

CMHC Project Officer : Susan Fisher

CIDN : 2158 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

OVERCOMING THE BARRIERS TO SUSTAINABLE REAL ESTATE DEVELOPMENT IN CANADA

The research will establish the features or framework by which a community might be deemed to be considered sustainable. Using this analytical framework it will develop a clear picture of the status of sustainable development in Canada and the barriers being faced in the implementation of sustainable communities. It will develop a parallel analysis of successful international projects focusing on those which successfully address problems encountered in Canada and from this comparison generate potential directions which might assist Canadians in overcoming barriers to sustainable real estate development.

CMHC Project Officer : Doug Pollard

CIDN : 2051 0200002

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

PLANNING SUSTAINABLE COMMUNITIES

The purpose of this project is to develop an updated advisory document on community planning and design. The updated document is intended to be a state-of-the-art report, reflecting the latest thinking in the field. The emphasis of the document will be on presenting practical examples (best practices and case studies) of innovative, sustainable and cost-effective approaches to community planning and design. Final report is in production.

CMHC Project Officer : Brian Eames

CIDN : 1553 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

PROTOTYPE HEALTHY HOUSE AT ROSEAU RIVER RESERVE IN MANITOBA

The objective of this study is to undertake and complete the conceptual design, construction drawings and inspections for a Prototype Healthy House at Roseau River Reserve in Manitoba.

CMHC Project Officer : Chris Ives

CIDN : 2036 0200002

Division : Prairie Region Business Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

**RESIDENTIAL GREENWAYS IN TRANSITION: FOUR DECADES OF PRACTICE IN
WATERLOO**

This research examines the evolution and assesses the merits of residential greenways employed in the City of Waterloo over the past four decades.

CMHC Project Officer : *Susan Fisher*

CIDN : *2144 0200015*

Division : *Research Division*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

RYDER LAKE "URBAN VILLAGE": DEVELOPMENT PLAN FOR A SUSTAINABLE COMMUNITY = LE VILLAGE URBAIN DE RYDER LAKE : PLAN D'AMÉNAGEMENT POUR UNE COLLECTIVITÉ DURABLE

Chilliwack, a community of sixty-five thousand located in British Columbia's Lower Mainland region, has responded to the challenge of accommodating a fast-growing population in an environmentally responsible manner by launching a project to build a sustainable community or "urban village" on 2,500 hectares in the adjacent hillside area of Ryder Lake. Recognizing the groundbreaking nature of such an initiative, in fall 1994, the ACT Program awarded the District of Chilliwack's Municipal Development Department a grant to be used towards the preparation of a plan, including development policies, standards and guidelines, for a high-density, compact community of approximately 40,000 people. A related goal of this project was to create an efficient approvals process for permit applications for development in Ryder Lake.

This ACT project resulted in the preparation of the Ryder Lake Area Plan ("The Plan"). The Plan proposes the use of a combination of flexible regulatory tools to guide the development of the Ryder Lake sustainable community. As a starting point, the District designated the entire Ryder Lake area as a "Development Permit Area" under the Municipal Act. This approach allows the District to protect the natural environment and to establish guidelines regarding the form and character of commercial and multi-family development. Furthermore, construction in Ryder Lake will be regulated by the application of performance standards rather than conventional prescriptive standards which are typically used to control suburban development. By focusing on the objectives and intent of the design, performance standards provide municipal authorities with an acceptable amount of control over the development process while, at the same time, enabling developers to build in a more creative manner.

The goals of the ACT Program - improving housing affordability, choice and quality through regulatory change - are clearly reflected in the development of sustainable communities such as Ryder Lake. The results of this project are very much applicable to other communities wishing to plan growth and development in a way that enriches the lives of its citizens while respecting the environment.

Affordability and Choice Today (A.C.T.) Demonstration Project / District of Chilliwack, British Columbia. Prepared by Julie Tasker-Brown. Prepared for: Federation of Canadian Municipalities, Canadian Home Builders' Association, Canadian Housing and Renewal Association, Canada Mortgage and Housing Corporation. Ottawa: The Federation; The Associations; CMHC, 1998.

STATUS : Completed Report

AVAILABILITY : Canadian Housing Information Centre

Canada Mortgage and Housing Corporation

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Fax.: 613-748-4069

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International clients see page 9 for order instructions.

SUSTAINABLE COMMUNITY DESIGN

This project sought to identify the features of a sustainable community and how they can be applied to the design of a new community. Several Canadian and international examples of built or proposed communities were used to seek out these features. It also tried to test consumer response to these design features by using images and facts from these example case studies and from a proposed design for a Canadian subdivision.

The study results are incorporated in a CD-ROM. It presents 150 sustainability features organized in distinct categories ranging from the house scale to the large community level. Text and images describe each feature and its effect on sustainability. All features are linked to a set of case studies where they are shown with pictures, drawings or diagrams. A list of references supports each aspect of community design along with Internet connections to many original sources. This component of the disc provides an extensive and comprehensive check list of all the elements that need to be considered in the design of a sustainable community. The visual descriptions of these elements would assist a designer in setting a starting point for a planned new community.

Visualizing the attributes of a sustainable community can also help gauge consumer reaction. The disc includes a complete questionnaire, in a sequence of electronic images, that can be used as a means of exploring the market for innovative features which cannot be found and experienced in real life settings.

*Prepared by Eduard Epp, Richard Perron, William T. Perks, Chris Sale, David van Vliet
Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)*

NOTE: CD-ROM available by interlibrary loan only.

STATUS : *Completed Report*

AVAILABILITY : *Interlibrary Loans*

Canadian Housing Information Centre

Canada Mortgage and Housing Corporation

700 Montreal Road

Ottawa, Ontario

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Fax.: 613-748-4069

Email: chic@cmhc-schl.gc.ca

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SUSTAINABLE DESIGN CHARRETTE FOR THE SOUTH EAST FALSE CREEK NEIGHBOURHOOD OF VANCOUVER

This project will report on the rationale and results of a design charrette structured to test the viability of sustainable community development guidelines. The report will include a brief history of the guideline development, the reasons for holding a charrette, a synopsis of CMHC research that was used, a critique of the effectiveness and value of the charrette. The report will also include drawings done at the charrette itself.

CMHC Project Officer : Doug Pollard

CIDN : 2076 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

SUSTAINABLE LANDSCAPE DESIGN FOR RESIDENTIAL DEVELOPMENTS

The objective of this project is to highlight the link between sustainable development for housing with the condition, composition and use of native vegetation.

CMHC Project Officer : Susan Fisher

CIDN : 1466 0200001

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

SUSTAINABLE MUNICIPAL INFRASTRUCTURE DESIGN FOR A RESIDENTIAL DEVELOPMENT

This project's objective is to review current practices pertaining to suburban communities in Southern Ontario, Canada and in other parts of the world; consider alternative design options for subdivisions and provide practical and up-to-date recommendations for the incorporation of sustainable community features.

CMHC Project Officer : Susan Fisher

CIDN : 2144 0200021

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

VIRTUAL REALITIES AS EVALUATIVE SUSTAINABLE COMMUNITY DESIGN CRITERIA

The objective of this project is to identify appropriate design criteria and develop, test and evaluate a method for determining consumer receptivity to sustainable community design using a series of virtual reality simulations. The criteria and simulations will be recorded on a CD-ROM to assist designers and developers in finalizing community designs and in convincing officials and public about the merits of such designs. Publication is expected in the spring of 2000.

CMHC Project Officer : Fanis Grammenos

CIDN : 2013 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

CASE STUDIES OF POTENTIAL APPLICATIONS OF INNOVATIVE RESIDENTIAL WATER AND WASTEWATER TECHNOLOGIES

Objectives of this project were to identify and describe opportunities for use of innovative water supply and wastewater systems for residential buildings, to compare costs and benefits of traditional and innovative systems, and to propose solutions that could lead to more cost-effective and environmentally friendly housing. The innovative technologies considered are those used in the Toronto Healthy House: a rainwater cistern system, and recycling of all household wastewater, for non-potable uses. In five case study sites in Nova Scotia, life cycle costs of these technologies were compared with costs of traditional infrastructure alternatives -- municipal water and wastewater, or wells and on-site sewage disposal systems. These comparisons indicate that the Healthy House technologies could be cost-competitive in an urban or suburban subdivision if fire protection is not required; a non-urban area as an alternative to a cluster system, or in a non-urban area as an alternative to a remedial central system. Other situations where they might be appropriate are also discussed. Other non-cost issues -- technological, management, regulatory, and public and political -- that must be considered if these technologies are to be adopted are identified and discussed. Recommendations are offered about strategies and actions that can take advantage of opportunities and address problems and issues related to adoption of innovative technologies for residential water supply and wastewater management.

Prepared by D.H. Waller, M.A. Salah, Centre for Water Resources Studies, DalTech. CMHC Project Officers: Peter Russell, Stéphanie McFadyen. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

STATUS : Completed Report

AVAILABILITY : Canadian Housing Information Centre

Canada Mortgage and Housing Corporation

700 Montreal Road

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Fax.: 613-748-4069

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International clients see page 9 for order instructions.

DEVELOPMENT OF A RESIDENTIAL WATER USE MODEL

The first phase of this project developed a user-friendly computer model that determines daily water consumption for a prescribed pattern of water use in a house that incorporates facilities to treat and reuse grey water. The program will be of value to designers of innovative residential plumbing systems. Its first application was in the design of the water system for the Toronto Healthy House and the Conservation Co-op apartment building in Ottawa. This second phase of the project saw the revision of the WaterSave program to more realistically represent water quality and account for contamination concentration build-up in the recycled water. Sample reuse situations were also accounted for in the revised model and the user's manual was updated. The consultants are in the process of exploring opportunities for marketing the software.

CMHC Project Officer : Cate Soroczan

CIDN : 1422 0200002

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication will not be published

ECONOMIC FEASIBILITY STUDY OF WATER REUSE AND TREATMENT TECHNOLOGIES

The purpose of this project is to undertake and complete an economic feasibility study of water reuse and treatment technologies. The contractor will assess ten case studies of on-site water reuse applications. Final draft is expected by the end of August.

CMHC Project Officer : Cate Soroczan

CIDN : 2089 0200002

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

GREYWATER TECHNOLOGY SOFTWARE DEVELOPMENT

CMHC is participating with Water Technology International in this research project to further develop the TECHSPEX software package to address water use, reuse and treatment. This product will provide a number of technical solutions to onsite or small community water treatment requirements based on user needs. Costs for the items specified and product availability are also included in the software development.

CMHC Project Officer : Cate Soroczan

CIDN : 1927 0200

Division : Research Division

STATUS : Completed

AVAILABILITY : Publication will not be published

HOUSEHOLD GUIDE TO WATER EFFICIENCY

Based on a highly successful document by the Region of Durham, this project will create a Canadian Water Efficiency Guide for homeowners. The document requires further research of national water use and pricing statistics, regional water needs, and regionally appropriate information on xeriscaping. The completed version will be available in hard copy and a CD version for individual municipalities to produce and disseminate it.

CMHC Project Officer : Cate Soroczan

CIDN : 2238 0200

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

LIVING BY WATER GUIDEBOOK

The objective of this project is to prepare, publish, market and distribute a guidebook for waterfront residents on reducing environmental impacts of housing on aquatic and shoreline habitat.

CMHC Project Officer : Susan Fisher

CIDN : 2040 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

ON-SITE STORMWATER MANAGEMENT ALTERNATIVES

This study will provide practical information to municipalities and developers to encourage them to adopt stormwater management alternatives both at the lot and community level. It will examine the costs and benefits of practical solutions as well as the barriers to implementation through a series of case studies.

CMHC Project Officer : Cate Soroczan

CIDN : 2087 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

ON-SITE WATER REUSE QUALITY AT QUAYSIDE VILLAGE CO-HOUSING CORPORATION

The water reuse system at Quayside village has been completed. Preliminary testing is under way and the monitoring program should start by Fall '99.

CMHC Project Officer : Cate Soroczan

CIDN : 1991 0200003

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

QUAYSIDE VILLAGE GREYWATER DEMONSTRATION PROJECT

A greywater system similar to that of the Toronto Healthy House system is being implemented into a 19 unit cohousing project in North Vancouver, B.C. This system will be capable of treating greywater from sinks, laundry, and showers for reuse in showers, laundry and toilets. Initial testing will be restricted to toilet reuse only. Double plumbing has already been installed and the greywater system is being installed following the signing of a contractual agreement between the city and development regarding ongoing monitoring and maintenance. Upon completion the system will be subject to continuous online water quality monitoring and laboratory analysis to ensure that both the system and the online monitoring is working to satisfaction. The system is now working and monitoring is underway.

CMHC Project Officer : Cate Soroczan

CIDN : 1991 0200

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

SUSTAINABLE HOME WATER SYSTEM

The objective of this research is to develop a system which will collect rain water for non-potable uses in a house plus a grey water heat recovery and recycling system.

CMHC Project Officer : Cate Soroczan

CIDN : 1224 0200001

Division : Housing Technology Incentives Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

SUSTAINABLE HOME WATER SYSTEM AT THE ALBERTA SUSTAINABLE HOME/OFFICE

The objectives of the Sustainable Home Water System (SHWS) project were:

- to design an autonomous home water system which includes a rainwater collection, storage, and treatment system; greywater heat recovery; and a greywater treatment and recycling system;
- to install the SHWS at the Alberta Sustainable House as a demonstration prototype;
- to monitor and evaluate the performance of the SHWS and greywater heat exchangers; and
- to determine the SHWS viability in the Canadian housing industry as a retrofit and for new home installations.

The Sustainable Home Water System (SHWS) at the Alberta Sustainable Home/Office reduces total residential water use by 78% compared with average Calgary households.

Collected rainwater is treated on demand to satisfy potable water requirements and meets Canadian Drinking Water Quality Guidelines (1996) for all parameters tested, however aesthetic objectives are slightly exceeded for temperature.

Heat from greywater is reclaimed through the counter current and drum storage greywater heat exchangers contributing 7.4% and 4.4% respectively to hot water heating. In-series operation accounts for 16.8% of the hot water heating required at the ASH home/office.

The greywater is treated using slow sand filters, soil box subirrigation, and a Greywater Garden Wall. The treated greywater conforms to non-potable water guidelines from several US states, apart from the elevated levels of total suspended solids. This reuse water satisfies 86% of the total ASH home/office water demand (i.e. ultra low flush toilet, bathing, clothes washing, and subsurface irrigation).

The Sustainable Home Water System is a cost-effective, environmentally-friendly, safe home water system which can easily be installed in new homes, and SHWS components can be incorporated into existing residential water systems. Maintenance and operation requirements are inexpensive and require limited time, however, a complete understanding of the system is required. Further research, monitoring, and adaptations to the water treatment system will be continued to improve the SHWS.

Prepared by Jorg Ostrowski and Karen Braun, A.C.E. - Alternative & Conservation Energies, Inc. CMHC Project Officer: Stéphanie McFadyen. Ottawa: Canada Mortgage and Housing Corporation, 1998. (Housing Technology Incentives Program)

STATUS : Completed Report

AVAILABILITY : Canadian Housing Information Centre

Canada Mortgage and Housing Corporation

700 Montreal Road, Ottawa, Ontario, K1A 0P7

Tel.: 613-748-2367 or 1-800-668-2642

Fax.: 613-748-4069

Email: chic@cmhc-schl.gc.ca

International clients see page 9 for order instructions.

WATER RECYCLING DEMONSTRATION

The goal of this project was to produce a water recycling unit that is created from off the shelf components. Eight units in Ottawa's Conservation Co-operative are double plumbed for the reuse of treated shower water for toilet use. Analysis of the initial system indicated a number of design flaws. A second system is now up and running and performance monitoring is underway. Initial results indicate that the system is working well and water quality is meeting all requirements.

CMHC Project Officer : Cate Soroczan

CIDN : 1573 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

Y2K

PREPARING YOUR APARTMENT FOR Y2K. ABOUT YOUR HOUSE SERIES; CE 20

This guide has been prepared to provide you with the necessary information to assess the degree to which the Y2K problem could affect your apartment and building. This guide focuses on the appliances, equipment and systems which provide for your health, comfort and security: local utilities, electricity, water, fresh air, electronic access systems and heating. Information regarding consumer goods such as VCRs, camcorders, stereos, televisions, and home computers can be obtained directly from the manufacturer or the store where you bought them.

Ottawa: Canada Mortgage and Housing Corporation, 1999.

STATUS : Completed Report

AVAILABILITY : Canadian Housing Information Centre

Canada Mortgage and Housing Corporation

700 Montreal Road

Ottawa, Ontario

K1A 0P7

Tel.: 613-748-2367 or 1-800-668-2642

Fax.: 613-748-4069

Email: chic@cmhc-schl.gc.ca

International clients see page 9 for order instructions.

PREPARING YOUR HOME FOR Y2K. ABOUT YOUR HOUSE SERIES; CE 16

This guide has been prepared to provide you with the necessary information to assess the degree to which the Y2K problem could affect your home. This guide focuses on the appliances, equipment and systems which provide for your health and security: loss of electric power, loss of natural gas, loss of water supply, and communications. Information regarding consumer goods such as VCRs, camcorders, stereos, televisions and home computers can be obtained directly from the manufacturer or the store where you bought them.

Ottawa: Canada Mortgage and Housing Corporation, 1999.

STATUS : *Completed Report*

AVAILABILITY : *Canadian Housing Information Centre*

Canada Mortgage and Housing Corporation

700 Montreal Road

Ottawa, Ontario

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SOCIAL AND ECONOMIC RESEARCH

ABORIGINAL HOUSING AND COMMUNITY SCENARIOS IN URBAN PRAIRIE CITIES

This research project will explore alternative futures for the housing situation of Aboriginal peoples in selected Prairie cities. The technique to be employed is to construct a number of future scenarios for each location, ready for presentation to a group of key people in each location. A wide range of inputs would be used to construct the scenarios. Three scenarios would be used for each location - each would have a theme or story line and the basic themes would be repeated at each location. While the themes of the scenarios would be common to each location, each scenario would be 'tuned' to account for local circumstance. Inputs would include, for example, demographic trends, local housing market conditions, and community plans and preferences as well as local opportunities.

CMHC Project Officer : Philip Deacon

Division : Research Division

STATUS : Planned

AVAILABILITY : Publication is not available

ADDRESSING SPECIAL HOUSING NEEDS IN FIRST NATION COMMUNITIES

In the 1991 Census, the rate of disability reported by Aboriginal adults was twice as high as that in the Canadian population as a whole. Specifically in the area of housing, the report on the Round Table on Disabilities in First Nations Housing in 1993 referred to a range of problems including a lack of alternative housing, the need to review policies to identify barriers to service provision, and the inappropriateness of prevailing barrier free home designs for Indian reserves.

"Completing the Circle", the Standing Committee report on Aboriginal people with disabilities talked of the need for co-operation and support at the community level if the problems of disabled Aboriginal people are to be addressed. The Department of Indian and Northern Development evaluation of their contribution to the National Strategy for the Integration of Persons with Disabilities found that lack of information is the most significant barrier to First Nations people in finding the help they need.

Using the findings of these initiatives as a framework, as well as the findings of the Home Adaptations for Seniors Independence evaluation, this study profiles specific on-reserve communities in Atlantic Canada, identifying how they are addressing the housing needs of their disabled members, and on the basis of this, developed strategies and mechanisms for such communities to do it effectively. The report identified recommendations for action by stakeholder groups (Aboriginal organizations in partnership with government) and by individual First Nation communities themselves. It also provided an evaluation of the objectives of the project.

A common element among the recommendations is the need for First Nation disabled people to play a key role in all issues affecting them including: identifying needs, establishing criteria for assistance, making decisions, and being the advocating voice. Another common element is the need for First Nation communities to take a proactive planning approach to meet the special needs of disabled and elderly in their communities, incorporating their needs into the bigger picture of planning for the future of their communities.

The "Completing the Circle" report identified that there were major gaps and administrative problems in meeting the needs of disabled Aboriginals. This research confirmed that in Atlantic Canada First Nation communities there are still a number of problems related to these issues. In particular, this research found that there is concern about the inability, real or perceived, to access provincially funded programs to meet on-reserve needs and the uneven provision of basic support services across the communities.

Prepared by: Rural and Small Town Programme. David Bruce, Senior Associate and Tracey Weatherston, with John Higham and Judy Reid. Ottawa: Canada Mortgage and Housing Corporation, 1998.

STATUS : Completed Report

AVAILABILITY : Canadian Housing Information Centre

Canada Mortgage and housing Corporation

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Tel.: 613-748-2367 or 1-800-668-2642

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CORE HOUSING NEED AMONG OFF-RESERVE INUIT, MÉTIS, STATUS AND NON-STATUS INDIANS IN CANADA

This study, based on the 1991 Aboriginal Peoples Survey (APS) and 1991 Census, explores housing need among Inuit, Métis, Status and Non-Status Indian peoples living off-reserve. It profiles the factors that influence the high levels of core housing need experienced by each individual Aboriginal group.

The report brings to light two key conclusions regarding the overall incidence of Aboriginal housing need off-reserve:

- a large proportion of Aboriginal households located in northerly, remote areas of the country occupy housing that is crowded, in need of major repair and lacking adequate bathroom facilities. These physical housing problems are most commonly experienced in Labrador, the northern Prairies and the Northwest Territories; and,
- Aboriginal households are especially likely to fall into core housing need - that is lacking access to housing that is adequate in condition, suitable in size and affordable - in a number of urban areas in Western Canada, most because they are dedicating high proportions of their income to shelter.

Prepared by Ark Research Associates, Ark Research Manager: Aron Spector. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Manager: John Engeland. Ottawa: CMHC, 1998.

*Order Number PEO295 ** Price \$12.95 + GST and handling charges.*

STATUS : Completed Report

AVAILABILITY : CMHC Information Products

P.O. Box 35005

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Toronto, Ontario M7Y 6E5

1-800-668-2642

Fax order from Canada: 1-800-245-9274

International clients see page 9 for order instructions.

FEASIBILITY AND VIABILITY OF MANAGING THE POOLED REPLACEMENT RESERVE FUNDS OF FIRST NATIONS AND URBAN NATIVE HOUSING GROUPS

The objective of this project is to research and prepare a report which examines the feasibility and viability of managing the pooled replacement reserve funds of First Nations and Urban Native Housing groups.

CMHC Project Officer : Tina Heal

CIDN : 2084 1500001

Division : B.C. & Yukon Business Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

RISK MANAGEMENT AND INSURANCE IN ABORIGINAL COMMUNITIES: TWO CASE STUDIES

The cost of insurance is often three times higher in Aboriginal communities than in comparable non-Aboriginal communities. Previous research has shown that less than half of this extra cost can be justified because of the extra risks involved. This report describes two examples of Aboriginal communities who reduced the costs of their insurance through applying a risk management approach and competitive tendering. The 14 Inuit communities of the Kativik Regional Government in Nunavik achieved a decrease of 50% in cost, followed by a further reduction of 20% two years later. The scope of the coverage was improved with the same broker and insurance company as before. The Naskapi Band of Quebec took the same approach. It saved some 70% on the cost of insurance, while improving the quality of its coverage. Here the broker and insurance company changed. Risk management is a continuous and systematic series of activities with three distinct goals: to minimize the likelihood of accidents, to limit their severity, and to ensure that the pre-accident situation can be restored.

Ottawa: Canada Mortgage and Housing Corporation, 1999. 16 pages.

STATUS : Completed Report

AVAILABILITY : Canadian Housing Information Centre

Canada Mortgage and Housing Corporation

700 Montreal Road

Ottawa, Ontario

K1A 0P7

Tel.: 613-748-2367 or 1-800-668-2642

Fax.: 613-748-4069

Email: chic@cmhc-schl.gc.ca

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ABORIGINAL HOUSING

URBAN ABORIGINAL ACCESS TO HOUSING (AND HOMELESSNESS)

This research study will develop a survey instrument to measure the longitudinal profile of Aboriginal household mobility, access to housing and homelessness using a historical interview technique. Snapshot surveys tell us that Aboriginal households are significantly more mobile than non-Aboriginal. This hyper mobility includes not only movement between reserve or home community and urban areas, but also between urban areas and within urban areas. The hyper mobility may lead to frequent difficulties in accessing accommodation, especially when coupled with the low socio-economic status of many Aboriginal households and discriminatory practices of some landlords. Some literature suggest that this combination of circumstances could be a major factor leading to Aboriginal homelessness. About 45% of the Aboriginal population live in cities and this segment of the population is expected to grow by almost half by 2016, which will likely exacerbate the situation.

CMHC Project Officer : Philip Deacon

CIDN : Plan 7-9018

Division : Research Division

STATUS : Planned

AVAILABILITY : Publication is not available

CANADA MORTGAGE & HOUSING CORPORATION

EVALUATION STUDY OF CMHC'S DIRECTED RESEARCH

The objective of this project is to carry out an evaluation study of CMHC's directed research.

CMHC Project Officer : Patricia Streich

CIDN : 2170 0500001

Division : Audit and Program Evaluation Services

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

HISTORY OF THE CMHC'S FIRST FIFTY YEARS: 1946-1996

The purpose of this project is to write a history of CMHC's first fifty years (1946-1996).

CMHC Project Officer : Eric Tsang

CIDN : 2113 0600001

Division : Strategic Planning

STATUS : Ongoing Project

Policy & Marketing

AVAILABILITY : Publication is not available

SUMMARY OF THE CORPORATE PLAN, CANADA MORTGAGE AND HOUSING CORPORATION 1999-2003 = RÉSUMÉ DU PLAN D'ENTREPRISE, SOCIÉTÉ CANADIENNE D'HYPOTHÈQUES ET DE LOGEMENT 1999-2003

This Summary of the 1999-2003 Corporate Plan for Canada Mortgage and Housing Corporation (CMHC) and the 1999 annual budget are required by the Financial Administration Act. The Summary briefly profiles CMHC, highlights key achievements for 1998 and discusses external factors affecting CMHC. The Summary also sets out how CMHC plans to meet its four corporate objectives from 1999 to 2003, and how CMHC's activities and their results will make a difference to Canadians. Finally, the Summary presents CMHC's financial plans and the resources it requires to carry out federal housing policy over the next five years.

Ottawa : CMHC = SCHL, 1999.

STATUS : Completed Report

AVAILABILITY : *Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, Ontario
K1A 0P7
Tel.: 613-748-2367 or 1-800-668-2642
Fax.: 613-748-4069
Email: chic@cmhc-schl.gc.ca
International clients see page 9 for order instructions.*

CHILDREN'S ENVIRONMENTS

ENVIRONMENTAL SCAN: CHILDREN AND POVERTY

This project will involve preparation of an environmental scan or background report on children and poverty, as it relates to housing. This document will include information on demographics, social and economic characteristics, key players, references and potential consultants, as well as housing circumstances for children's housing and living environments.

CMHC Project Officer : *Gloria Neufeld Redekop*

CIDN : *Plan 7-6683*

Division : *Research Division*

STATUS : *Planned*

AVAILABILITY : *Publication is not available*

BRINGING THE HABITAT AGENDA HOME

The purpose of this project is to publish a book to inform the membership and others in the Canadian Habitat NGO network about the outcome of the Habitat II Conference and the Habitat Agenda, as well as to provide information and ideas in order to facilitate the implementation of the Habitat Agenda.

CMHC Project Officer : Louis Musto

CIDN : 1965 0900001

Division : Canadian Housing Export Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

DEMONSTRATION OF FULL-COST ACCOUNTING TOOLS AND TECHNIQUES

The objective of this project is to demonstrate the benefits of using full-cost accounting tools and techniques to evaluate the social, economic and environmental costs and impacts associated with urban growth and to analyse the full costs and impacts of growth in a selected infrastructure in areas of the Fraser Valley regional District as a case study. The final report will also describe state of the art of assessment methods and tools.

CMHC Project Officer : Doug Pollard

CIDN : 2127 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

EFFECTS OF DEVELOPMENT CHARGES ON URBAN FORM: AN ECONOMETRIC STUDY

This econometric study examines the connections between development charges placed on residential construction and the spread and density of cities.

CMHC Project Officer : David D'Amour

CIDN : 1941 0200001-2

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

GRANVILLE ISLAND: AN URBAN OASIS

Twenty years ago, Granville Island was transformed from a decrepit 37-acre industrial slum in Vancouver's False Creek to possibly the most successful urban redevelopment ever seen in North America. Rusty tin-sided factories were reborn as a public market, an art school, shops, restaurants, theatres, and a great deal more. Today, Granville Island boasts more than eight million visits a year, 2,600 jobs and the highest sales per square foot of any public market on this continent.

This book chronicles the Granville Island story, celebrates what the Island has to offer, and peers inside its seldom-seen inner life. It describes the Island's heritage, its transformation, attractions and amenities and its working life.

Prepared by Michael McCullough. Vancouver : Granville Island Office, Canada Mortgage and Housing Corporation, 1998.

**** Price: \$39.95 + GST and handling charges.**

STATUS : *Completed Report*

AVAILABILITY : *Granville Island Office*

Canada Mortgage and Housing Corporation

1661 Duranleau St., 2nd Floor

Vancouver, BC

V6H 3S3

Tel.: 604-666-6655

Fax.: 604-666-7376

LE PROGRAMME ÉCO-QUARTIER DE LA VILLE DE MONTRÉAL: UNE INNOVATION EN ÉVOLUTION

The Éco-quartier program was organized by the City of Montreal to involve its citizens in locally-based environmental initiatives. The purpose of this report is to evaluate the program so that readers from Montreal and all municipalities across Canada can benefit from lessons learned.

This innovative program responds to local environmental needs, most particularly collecting recyclable materials and greening the city. However, it has not addressed large-scale environmental problems such as air pollution. In this regard, it has been more focused on issues that directly affect local citizens. Thus the mandate or scope has been somewhat limited.

Regarding its greening the city activities, a horticultural approach has been favoured over an ecological approach, i.e. beautification over biodiversification. Interviews reveal that participation in the activities by citizens has been weak on the design and maintenance of the planted sites, but that local citizens enjoy the initiatives and feel that they fill a social need.

To improve the program, the organizers should involve residents in all phases of the projects, favour use of public spaces over private lots, and make better use of partnerships. They should also expand the program to address other local environmental issues.

Prepared by Gilles Sénécal and Diane Saint-Laurent with the collaboration of Anne-Marie Charlebois and Daniel Léonard. CMHC Project Officer: Susan Fisher. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

STATUS : Completed Report

AVAILABILITY : Canadian Housing Information Centre

Canada Mortgage and Housing Corporation

700 Montreal Road

Ottawa, Ontario

K1A 0P7

Tel.: 613-748-2367 or 1-800-668-2642

Fax.: 613-748-4069

Email: chic@cmhc-schl.gc.ca

International clients see page 9 for order instructions.

BENCHMARKING PHYSICAL PLANT EXPENDITURES IN NON-PROFIT HOUSING

The objective of this project is to assess expenditures and practices related to the physical plant in non-profit housing providers.

CMHC Project Officer : Duncan Hill

CIDN : 2003 0200001

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

CRISIS SITUATIONS IN COOPERATIVES: INCREASING UNDERSTANDING TO IMPROVE INTERVENTION

This research project concerns crisis situations in housing cooperatives: the conditions in which they emerge, but especially the dynamics put in place to resolve them.

CMHC Project Officer : Marie Murphy

CIDN : 2018 0200001

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

CRIME PREVENTION

SAFE COMMUNITIES: INFORMATION PRODUCTS AND TRAINING MATERIALS

In partnership with the RCMP, CMHC is developing materials to promote the principles of crime prevention through environmental design (CPTED). Priorities were identified at a stakeholder forum held in the Spring of '97. Materials include case studies of success stories at the subdivision and community level, and the enhancement and adaptation of training materials for a variety of distinct audiences, including builders and developers. A draft advisory document has been prepared which will be reviewed and finalized in 1999.

CMHC Project Officer : Mark Holzman

CIDN : 1938 0200002

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

DISCRIMINATION IN HOUSING

HOUSING AND DISCRIMINATION: A REVIEW OF CURRENT KNOWLEDGE

The objective of this research is to identify and examine what knowledge and expertise regarding housing-related discrimination is available in or applicable to Canada.

CMHC Project Officer : Teresa Van Den Boogaard

CIDN : 1792 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

HOUSING AND DISCRIMINATION: THE LEGAL FRAMEWORK

The purpose of this project is to examine housing related discrimination from a legal perspective and to understand how housing-related discrimination fits in Canada's legal framework.

CMHC Project Officer : Teresa van den Boogaard

CIDN : 1793 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

HOME OWNERSHIP

CONSUMER EDUCATION & COUNSELING MEASURES USED TO FACILITATE & SUSTAIN ACCESS TO HOME OWNERSHIP

The objectives of this project are to review and assess the nature, scope, operation and results of US consumer education and homeowner post-purchase counseling initiatives aimed at facilitating affordable and sustainable access to homeownership and then to compare this to the current state of affairs in Canada. In the U.S. an increased emphasis has been placed on providing pre-purchase home buyer education and post-purchase counseling in order to mitigate the perceived higher default-risk associated with homeownership loans to lower income households. In recognition of the value of such counseling, HUD offers mortgage insurance premium reductions to households successfully completing such programs. This project will be of interest to organizations involved in facilitating, supporting, and sustaining household's access to homeownership.

CMHC Project Officer : David Metzak

CIDN : 2122 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

HOMEOWNER'S MANUAL

The Homeowner's Manual was designed to provide builders with a tool to reduce the time and cost of customer callbacks. Builders can now provide their clients with a Homeowner's Manual filled with practical, easy-to-read information on operation and maintenance customized for their new home.

The Homeowner's Manual is a print-on-demand product to allow for customization. It is divided into three sections covering:

- 1) customized information based on the particular specifications of the individual home (e.g. type of roofing, foundation ...)
- 2) generic home care information, seasonal maintenance charts ...
- 3) a plastic sleeve for inclusion of the New Home Warranty, home plans ...

The Homeowner's Manual is endorsed by the Canadian Home Builder's Association (CHBA) as well as the Canadian New Home Warranty Council (NHWC). Builders who are members of the CHBA or provincial members of the NHWC will have the appropriate association logos printed on the cover of the product.

Builders who purchase this manual for their customers will be providing outstanding customer service, enhancing their professional image and reducing after-sales service costs.

The primary benefit to homeowners is a customized and comprehensive permanent reference tool to help them operate and maintain their new home. It has easy-to-follow text, lots of clear illustrations and environmental, money-saving and health tips.

Ottawa: Canada Mortgage and Housing Corporation, 1999.

Order number: NE2322 **Price: \$39.95 + GST and handling charges.

STATUS : Completed Report

AVAILABILITY : Canadian Housing Information Centre

Canada Mortgage and Housing Corporation

700 Montreal Road

Ottawa, Ontario

K1A 0P7

Tel.: 613-748-2367 or 1-800-668-2642

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Email: chic@cmhc-schl.gc.ca

International clients see page 9 for order instructions.

HOME OWNERSHIP

METHODS USED ABROAD TO SUPPORT ACCESS TO HOME OWNERSHIP

The objective of this research is to investigate significant and novel mechanisms which other nations have employed, encouraged and/or are considering that support and facilitate access to home ownership in general or to target populations. The intent is to identify new mechanisms that might be implemented in Canada that hold promise to improve access to home ownership. The review will cover the U.S., U.K., Germany, France, Australia and New Zealand. This project will be of interest to the construction and renovation industry, the real estate sales sector, mortgage lenders and insurers as well as federal and provincial housing policy analysts.

CMHC Project Officer : David Metzak

CIDN : 1931 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

STUDY ON THE PREFERENCES OF GENERATION X IN TERMS OF HOUSING

The purpose of this project is to determine the factors that keep the younger generation in rental housing and the ones that attract them to buy; and to conduct seven group discussions: four in Montréal; two in Québec and one in Sherbrooke. The information will be presented at a conference.

CMHC Project Officer : Jean Laferriere

CIDN : 2139 1000001

Division : Market Analysis Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

HOMELESSNESS

ROUNDTABLES ON BEST PRACTICES ADDRESSING HOMELESSNESS

CMHC co-hosted five regional roundtables in April 1999 and a national roundtable in June 1999 on best practices addressing homelessness, using the "Best Practices Addressing Homelessness: Documentation" as a basis for discussion. The regional roundtables were co-hosted by CMHC and local homelessness organizations. The roundtables were effective opportunities for network building and exchange of information on effective best practices. A final document was prepared containing brief summaries of the six roundtables and "regional backgrounders" on key homelessness issues, prepared by the co-host homelessness organizations.

CMHC Project Officer : Gloria Neufeld Redekop

CIDN : 2064 0200

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

SERVICES FOR CHILDREN AND YOUTH IN CANADIAN SHELTERS FOR HOMELESS FAMILIES

This project will investigate the availability and viability of space allocations and services for youth and children in emergency family shelters (i.e., family units in homeless shelters, temporary and satellite shelters such as hotels, and shelters for victims of family violence).

CMHC Project Officer : *Gloria Neufeld Redekop*

CIDN : *2085 0200*

Division : *Research Division*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

WOMEN ON THE ROUGH EDGE: A DECADE OF CHANGE FOR LONG-TERM HOMELESS WOMEN

There have been significant changes over the past decade in the profile of women's homelessness and the service context. The proportion of women who use the emergency shelter system in Toronto increased from 24 to 37 percent from 1988 to 1996. As more women become homeless and the existing social service and health system is less able to assist them, the most vulnerable stay homeless for longer periods.

This report constitutes a retrospective review of the changing patterns of women's homelessness in the Toronto area from 1987 to 1997, with a focus on conditions and services for long-term homeless women, based on the observations and expertise of those who have worked closely with homeless women over the previous decade. Interview data from a small number of homeless women are included, along with a research-based profile of long-term homelessness among women in Toronto.

The report discusses distinctions in shelter and other service use patterns among homeless women (i.e., transitional, episodic, and chronic homelessness) and implications for housing and support service requirements. Women who are homeless for long periods of time face similar circumstances as other homeless women except that their personal resources are fewer, their state of physical and mental health poorer, and their individual capacity to cope is weaker. They are very likely to have severe mental health problems, and it appears that the prevalence of addictions is increasing.

Prepared by Sylvia Novac, Joyce Brown, Gloria Gallant. CMHC Project Officer: Brenda Baxter. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

STATUS : Completed Report

AVAILABILITY : Canadian Housing Information Centre

Canada Mortgage and Housing Corporation

700 Montreal Road

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K1A 0P7

Tel.: 613-748-2367 or 1-800-668-2642

Fax.: 613-748-4069

Email: chic@cmhc-schl.gc.ca

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HOUSE CONSTRUCTION INDUSTRY

HOUSING CONSTRUCTION INDUSTRY: CHALLENGES AND OPPORTUNITIES FOR THE 21st CENTURY

The objective of this study is to examine the evolution of the housing industry in Canada since the mid-1980s, the industry's current and expected future challenges in the period to 2010, and the ways it might and should adapt.

CMHC Project Officer : Ian Melzer

CIDN : 1987 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

HOUSING

EXAMINE THE FEASIBILITY OF STUDYING THE CORRELATION BETWEEN ADEQUATE HOUSING AND HEALTH AND EDUCATION

This research proposal will examine the feasibility of studying the correlation between adequate housing and health and education.

CMHC Project Officer : Line Gullison

CIDN : 2193 1500001

Division : Strategic Planning

STATUS : Ongoing Project

Policy & Marketing

AVAILABILITY : Publication is not available

FUTURE OF THE INTERNET AND THE HOUSING SECTOR

This study examines the extent of the usage of the Internet in the housing sector. It also briefly explains the Internet and its main features, the history of its general usage, growth worldwide and the opportunities it provides for the housing sector over the next few years. Trends associated with Internet usage are discussed for the following areas of the housing sector: housing construction; the real estate sector, housing financing and evaluation; governments and government agencies; industry associations and urban planning in general. The study provides a useful listing of housing-related Web sites in Canada and the United States in such areas as: institutional and government agencies; construction and architecture; real estate; financing and mortgage loans; planning and related specialties and co-operative housing.

*Prepared by Syllable Internet Expressions Inc. Reviewed and supplemented by Florence Millerand.
Prepared for Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1999. (Housing Affordability and Finance Series: Research Report)*

Order number: PE0317 **Price: \$12.95 + GST and handling charges.

STATUS : Completed Report

AVAILABILITY : CMHC Information Products

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HOUSING AND POPULATION HEALTH

This study looks at the links between housing and population health. Population health is a way of conceptualizing and acting on health, by focusing on why some groups in society are more prone to illness than other groups. This study will look at the extent to which housing is or may be a factor.

The study will commence with a comprehensive and critical review of the literature. This will be followed by an assessment of the evidence to date and the potential for evidence in the future, with an emphasis on the methodological and measurement issues. The project will conclude with a set of ideas for future research directions.

CMHC Project Officer : Philip Deacon

Division : Research Division

AVAILABILITY : Publication is not available

CIDN : 1926 0200001

STATUS : Ongoing Project

HOUSING, SOCIAL INEQUALITY AND POPULATION HEALTH

This study is a cross-sectional, survey-based investigation of relationships between housing, social inequality and population health in 13 Vancouver neighbourhood areas. Based on a model of the 'social determinants of health', the research examines relationships between differences in housing suitability, affordability, tenure, type, satisfaction, meaning, and neighbourhood social character on the one hand, and individual health status on the other, while controlling for age, gender, income, and ethnicity differences.

The major objectives are: to investigate ways in which social relations concerning housing and home contribute to the social production of health for individuals and to investigate ways in which housing (esp. affordability) and people's homes could act as a nexus for the production and reproduction of unequal social relations and social inequalities in health status.

CMHC Project Officer : Philip Deacon

CIDN : 2144 0200008

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

HOUSING AFFORDABILITY

AFFORDABLE HOUSING SOLUTIONS - FIFTEEN SUCCESSFUL PROJECTS

The project documents innovative approaches and "best practices" for creating affordable housing from the Canadian non-profit and municipal housing sectors. Fifteen case studies highlight several innovative approaches to producing affordable housing including life leases, redevelopment, equity cooperative, co-housing, fundraising and development fund. The case studies describe in detail the attributes of each project and the process that enabled their realization. It is a valuable source of information for affordable housing providers.

CMHC Project Officer : Fanis Grammenos

CIDN : 1794 0200002

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

AFFORDABLE, VERSATILE HOUSING

This project identifies and describes house designs that enable a house to accommodate a range of household types, sizes and needs by means of its adaptability. The report documents the features of designs that have been incorporated into built projects and explains their economic and use advantages. The set of designs included covers all housing forms, from single detached houses to multiple-family apartment dwellings. This is the first guide on adaptable designs that lists and classifies the means by which houses can become adaptable.

CMHC Project Officer : Fanis Grammenos

CIDN : 1783 0300001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

ALTERNATE TENURE ARRANGEMENTS

The project has two broad objectives: (1) to develop an up-to-date consolidated source of information on the range of alternate tenure arrangements that can be used to implement affordable housing through partnerships; and (2) to assess the extent to which projects utilizing alternate tenure arrangements have successfully met client needs, preferences and expectations. It is intended to be of interest to municipal and provincial officials, and not-for-profit and community groups. Work on the project will include a review of the types of alternate tenure arrangements that exist in Canada, as well as a more focused examination of specific Canadian alternate tenure arrangement projects.

CMHC Project Officer : David Scherlowski

Division : Research Division

STATUS : Planned

AVAILABILITY : Publication is not available

BACKGROUND RESEARCH ON PHILANTHROPIC SUPPORT FOR AFFORDABLE HOUSING

The recent Part IX research project entitled "The Role of Public-Private Partnerships (PPPs) in Producing Affordable Housing: Assessment of the U.S. Experience and Lessons for Canada" noted that philanthropies were a critical participant in the development of the PPP affordable housing system in the U.S. This research project will address the considerable information gap with respect to the role that philanthropic support has played and could potentially play in the provision of affordable housing in Canada. The project will provide organizations involved in either creating or supporting the creation of affordable housing through PPPs with an understanding of the opportunities, as well as alternative ways and means of obtaining financial support from the gamut of potential donor sources in the philanthropic sector. The research is being managed under the direction of an advisory committee that includes members from the Canadian Housing Renewal Association's Board, the CCPPPH National Advisory Committee, a former Director of the Canadian Centre for Philanthropy, CMHC national office and field staff from the CCPPPH as well as Research Division.

CMHC Project Officer : David Metzak

CIDN : 2073 200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

BLENDED INCOME HOUSING: LITERATURE REVIEW AND ANALYSIS

The purpose of this project is to provide a summary of the range of housing, social and economic issues and thinking on income blended housing projects. It is a jointly funded CMHC-Revenue Canada initiative with members of both agencies serving as advisory committee members. The final report will be of interest to third sector housing providers and homebuilders as well as municipal and provincial housing officials. The first phase of the project will focus on the development of an analytical framework which will be used in the review of literature on blended income housing. Literature from Canada, the United States, Great Britain and other western industrialized countries will be reviewed in the secondary phase. Findings from the second phase will be analysed so that a comprehensive picture of the range of issues on income blending in housing projects can be presented.

CMHC Project Officer : David Scherlowski

CIDN : 1925 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

COMPENDIUM OF HOUSING AFFORDABILITY STRATEGIES

This project will assemble an electronic database of strategies that have been successfully used to improve housing affordability. These strategies will appear under categories of activity such as: Policy and Regulation; Housing and Community Design; Financing and Tenure; Construction and Technology; Operations and Management; and Redevelopment. Each strategy will be explained and illustrated with an example project. The database is expected to be accessible through the CMHC web site and be fully searchable and linked to relevant sources of information of the strategies.

CMHC Project Officer : Fanis Grammenos

CIDN : 2053 0200004

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

GUIDE TO AFFORDABLE HOUSING PARTNERSHIPS

Today, partnerships have become more and more common in both the private and public sectors as a way of stretching limited resources and achieving strategic objectives. To help you work with other individuals and organizations to address housing needs in your community, Canada Mortgage and Housing Corporation has developed this guide. This guide is intended for individuals and organizations in the non-profit, public and private sectors who have an interest in providing affordable housing for families, single persons, seniors and people with disabilities.

A partnership in housing is an arrangement between two or more parties who agree to work together to achieve shared or complementary housing objectives. Partnerships in housing can be applied at different stages in the life cycle of housing creation - asset creation, maintenance or renewal. They may also be formed to solve housing problems and issues through program and policy development. Partnerships vary in their duration and in their level of formality. Partnerships in housing, except under federal and provincial housing programs, are a relatively new way of delivering housing in Canada. Nevertheless, an impressive number of initiatives have been undertaken or are currently underway. Examples of partnership approaches are given throughout the guide to help you gain a better understanding of the partnership process and how it can be applied to the provision of affordable housing.

Prepared by the consulting team of Linda Lapointe of Lapointe Consulting Inc., Lauren Millier and Greg Spafford of PricewaterhouseCoopers and Luba Serge. Ottawa: Canada Mortgage and Housing Corporation, 1999, c1998.

Order number: NE2216 **Price: \$19.95 + GST and handling charges.

STATUS : *Completed Report*

AVAILABILITY : *CMHC Information Products*

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MARKET ANALYSIS AFFORDABILITY SOFTWARE PROJECT

The objective of this project is to make modifications to Affordability to keep the software current with the latest technology; provide customization for interested clients/partners; create a fully functional Internet version should it be feasible; and provide technical support and expertise to help solve issues and problems that cannot be resolved by CMHC's help desk.

CMHC Project Officer : Greg Goy

CIDN : 1536 1000002

Division : Canadian Housing Export Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

MUNICIPAL REGULATION, LAND USE PLANNING AND FINANCIAL MEASURES TO ENCOURAGE NEW AFFORDABLE HOUSING PRODUCTION

The objective of this project is to raise awareness the range of alternative regulatory (i.e. inclusionary zoning, density bonusing, alternative development standards), land use planning (i.e. performance based planning) and financial measures (i.e. exaction programs) which can be used by municipalities during the development approval process in order to implement new affordable housing. The research is to identify and describe the range of alternative regulatory, land use planning and financial measures that can be used by municipalities to create new affordable housing. The project is aimed at addressing the information needs of planners, homebuilders, land developers, third sector affordable housing providers as well as municipal finance officials.

CMHC Project Officer : David Scherlowski

CIDN : 2080 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

MUNICIPAL REGULATORY INITIATIVES: PROVIDING FOR AFFORDABLE HOUSING

This report examines three types of regulatory initiatives used by municipalities to provide for affordable housing. These consist of inclusionary zoning, a variety of exaction programs including linkage fees, and density bonusing -- also known as incentive zoning in many places.

All these initiatives rely on the development approval process to encourage, enable or require for-profit developers in some way to provide for housing affordable specifically to lower-income households. While only used to a limited extent in Canada, they have been increasingly used across the United States since cutbacks to federal funding in the early 1980s.

This report is intended to make the opportunities offered by these initiatives more widely known to local housing officials and others involved in the development of affordable housing in Canada.

The recent experience with these initiatives in both countries is reviewed, drawing upon both published and municipal reports as well as extensive telephone interviews. The findings are presented mainly through an overview of the three types of initiatives and profiles of two dozen of the most important of representative examples.

Prepared by Richard Drdla Associates Inc. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project officer: David Scherlowski. Ottawa: CMHC, 1999. (Housing Affordability and Finance Series Research Report)

Order number: PE0326 **Price: \$12.95 + GST and handling charges.

STATUS : Completed Report

AVAILABILITY : CMHC Information Products

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NATURE, APPLICABILITY AND POTENTIAL OF HOUSING TRUST FUNDS IN CANADA

The objective of this project is to examine the nature and applicability of housing trust funds and the potential to establish them in Canada for the purpose of funding affordable housing development. The beneficiaries of this work will be municipal and provincial policy analysts, and finance officers, as well as non-profit and social housing providers

CMHC Project Officer : *David Scherlowski*

CIDN : *2071 0200001*

Division : *Research Division*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

RESEARCH ON AN IMPROVED MEASURE OF AFFORDABILITY FOR ESTIMATING HOUSING NEED IN CANADA

This study was undertaken to assist the Federal/Provincial/Territorial Partners in their review of the standard for housing affordability used in estimating Core Housing Need. Specifically, the report examines whether there is an alternative measure that better approximates housing affordability needs across the country than the current fixed 30-percent Shelter Cost-to-Income Ratio (STIR).

The study was comprised of three major components:

- Examining the fixed 20-percent STIR norm in relation to actual shelter spending patterns;
- Exploring alternative variable-STIR measures which aim to treat households with differing circumstances more equitably than is the case under a fixed STIR; and
- Estimating the number of households in need under the alternative approaches.

Prepared by Clayton Research Associates Limited in association with Fuller Information. Prepared for John Engeland, Research Division, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1997.
(Housing Affordability and Finance Series: Research Report)

Order No. PEO311 ** Price \$12.95 + GST and handling charges.

STATUS : Completed Report

AVAILABILITY : CMHC Information products

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ROLE OF PUBLIC-PRIVATE PARTNERSHIPS IN PRODUCING AFFORDABLE HOUSING: ASSESSMENT OF THE U.S. EXPERIENCE AND LESSONS FOR CANADA

This report examines how public-private partnerships (PPPs) have emerged in the United States as a delivery vehicle for the provision of affordable housing.

The report first reviews the historical factors and circumstances that bred the PPP system. This evolutionary period is contrasted with the conditions that prevailed in Canada. Part I briefly reviews and presents a conceptual framework to describe the range of mechanisms and measures that are used to patch together affordable housing.

Part 2 then introduces and reviews a set of illustrative case studies that were used to examine, in greater detail, how affordable housing projects and partnerships are structured and packaged in the United States. The key features of affordable housing projects and PPPs are highlighted.

Part 3 provides a brief overview of the Canadian context and reviews a smaller set of Canadian case studies. The experience in each country is juxtaposed as a way to help understand the differences that exist and the potential of some of the U.S. approaches to be adapted to fill voids in the Canadian system.

An overall assessment of the U.S. experience and the opportunities to expand the production of affordable housing in Canada through PPPs are the subject of Part 4.

Three detailed appendixes contain, respectively, greater detail on the mechanisms, measures and roles of key partners (Appendix A); profiles of the 15 U.S. case studies (Appendix B); and profiles of the seven Canadian case studies (Appendix C).

Prepared by Steve Pomeroy, Focus Consulting and Greg Lampert, Economic Consultant, in association with James Wallace, Abt Associates, and Robert Sheehan, Regis J. Sheehan and Associates. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Manager: David Metzak. Ottawa: CMHC, 1998. (Housing Affordability and Finance Series Research Report)

Order number: PE0318 ** Price \$12.95 + GST and handling charges.

STATUS : Completed Report

AVAILABILITY : CMHC Information Products

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ETHNICITY AND CULTURE IN TENANT PARTICIPATION

This case study looks at possible barriers to community participation that are specifically related to cultural and ethno-racial diversity and suggests strategies that have the potential to enhance participation. The setting for the study is a government assisted housing project in Toronto where the residents include a large number of immigrant families from many different cultural backgrounds.

The study showed that the main barriers to participation were a lack of knowledge about rights in the community, a perception that meetings were not effective and that nothing would be done about issues, and feelings of isolation and lack of confidence. However, these issues were not specific to any particular group and were not directly related to diversity. A few minor barriers which did have their origins in diversity were also noted.

The study concluded that, by and large, the main barriers were a matter of perception resulting from different expectations of the various cultural groups, management, staff and youth. There were also many straightforward actions that could be taken that would help close the gaps in expectations, and that these could be combined into five strategic approaches centred on: meetings, information dissemination, relationship building, involvement of cultural groups, and involvement of youth.

CMHC Project Officer : Philip Deacon

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

METROPOLIS CENTRES OF EXCELLENCE FOR RESEARCH ON IMMIGRATION ISSUES

CMHC and other federal departments provide ongoing financial support to stimulate and support policy-relevant research on immigration issues, through a network of research centres in Canadian universities. Information on Metropolis and on the almost 200 funded research projects can be found at <canada.metropolis.net>.

CMHC Project Officer : Tom Kerwin

CIDN : 2224 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

NEWCOMERS' GUIDE TO CANADIAN HOUSING

This guide is designed to answer newcomers' questions about renting or buying a house. It provides information about housing in Canada, sets out the nature and types of questions to ask landlords, building superintendents, real estate sales representatives, property managers and lenders and explains mortgages, interest, and the steps in buying a house.

CMHC Project Officer : Steve Mennill

CIDN : 1802 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

HOUSING AND TAXATION

LITERATURE REVIEW: TAX INCIDENCE IN THE CANADIAN HOUSING SECTOR

This project has three objectives: (1) to survey current thinking about tax incidence in the housing sector; (2) to determine what this might imply with regard to tax incidence in the Canadian housing sector; and (3) to identify what (if any) additional research would help us better understand the distribution of tax burden in Canadian housing. To achieve these objectives the contractor will summarize major theoretical approaches to tax incidence in housing, delineate a basic theoretical model of tax incidence, summarize relevant empirical literature and determine what can be reliably said about the incidence of taxes currently imposed on Canada's housing sector.

CMHC Project Officer : Orlando Manti

CIDN : 1980 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

ADAPTING CANADIAN HOUSING TECHNOLOGY TO INTERNATIONAL MARKETS: DESIGN, MATERIALS, COMPONENTS AND STRUCTURES

Canada has one of the most diverse and successful housing industries in the world. Operating from this solid base, hundreds of companies with housing-related products, technologies and systems to offer are operating in foreign markets. Many are looking actively for additional export and investment opportunities abroad. To succeed, they pay attention to differences from Canadian norms in national and local standards, cultural traditions, design and quality expectations.

This report answers three main questions: do buyers in foreign housing markets accept what Canadian firms have "off the shelf" at present?; how are Canadian exporters already adapting to specific requirements of foreign customers?; and what future opportunities exist to increase market share by adapting housing-related products, technologies and services?

Based on Statistics Canada export data, many Canadian housing-related materials and products already enjoy widespread acceptance in many foreign markets. Exporters assure buyers of the quality of goods through a variety of means, and also compete effectively on price, availability, and timeliness of delivery. Nevertheless, significant opportunities remain to expand market share through adaptation to local taste, conditions and standards.

Experienced housing exporters are already strongly committed to and acting on the idea of adapting what they sell in foreign markets. They alter design, colour, finishing, quality, performance, dimensions, language of literature or other features, in some cases substantially. However, more needs to be done to facilitate exchanges of practical information on this topic among current and prospective exporters, resulting in significant gains in Canadian export success. Against Canada's very able competitors in international housing markets, every marketing tool that can be created for Canadian firms is needed. Advantages to be gained over other Canadian firms by clutching best practices in many foreign markets are fleeting, if they exist at all. While there are obviously some proprietary technologies and products and commercial-confidential "tricks of the trade", most product and service adaptations are readily evident from published company literature. The potential market is often so vast that there is plenty of room for everyone from Canada, despite possible perceptions to the contrary.

Foreign private sector partners and government research institutes are increasingly likely to become partners in "co-evolving" a version of Canadian housing technology to meet their own circumstances and needs in future. However, this approach to adaptation must be approached with care, so as to avoid difficulties caused in Japan, for example, where Canada is more noted as a source of quality, competitively-priced lumber, than as a supplier of quality whole-house systems.

Certain Canadian companies focus on products, technologies and services specifically suited to international markets alone, mainly for "low cost" housing. With a few exceptions, the latter appear to be having only modest success at present. The most productive avenue for the future may lie in the direction of investing in local ventures and technology transfer rather than exports as such.

The report concludes with handy lists of key questions for potential use by Canadian companies exploring entry into new international markets or seeking to increase market share. These take the user through an issue-by-issue or element-by-element review of potential adaptation requirements and considerations.

HOUSING EXPORT OPPORTUNITIES

The report also contains contract information for experts in the field, and references for additional reading.

Prepared by C. David Crenna, The Bayswater Consulting Group Inc. CMHC Project Officer: Rob Duncan.
Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

STATUS : Completed Report

AVAILABILITY : Canadian Housing Information Centre

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Email: chic@cmhc-schl.gc.ca

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BUSINESS GUIDE TO GERMANY FOR THE CANADIAN HOUSING INDUSTRY

The objective of this project is to complete a detailed and accurate guide to Germany for the Canadian housing industry.

CMHC Project Officer : Louis Musto

CIDN : 1953 0900006

Division : Canadian Housing Export Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

CANADA'S HOUSING EXPORTERS AND PROSPECTIVE EXPORTERS IN ONTARIO

The purpose of this project is to conduct a study to identify and profile Canada's housing exporters and prospective exporters in Ontario.

CMHC Project Officer : Leslie Barrett-Sanderson

CIDN : 2153 0900001

Division : Canadian Housing Export Centre

STATUS : Ongoing Project

Ontario Business Centre

AVAILABILITY : Publication is not available

CANADIAN/JAPANESE CONSTRUCTION COST ANALYSIS OF A TYPICAL 2X4 FRAMED HOUSE PLAN

The purpose of this project is to develop a costing spreadsheet tool for use on all soft and hard costs forming part of the delivered turn key project including at minimum, design; permits and approvals; materials and labour etc.

CMHC Project Officer : Jay Thakar

CIDN : 1596 0900001

Division : Canadian Housing Export Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

CHINA HOUSING NEEDS SURVEY

The purpose of this project is to conduct the "China Housing Needs Survey" to determine the current and future housing needs of Canadian companies present in China, and to determine Canadian companies interested in locating staff in Canadian supplied housing.

CMHC Project Officer : Murray Rasmusson

Division : Canadian Housing Export Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

CODES AND STANDARDS PROPOSAL TO GERMANY

This project's objective is to develop and implement a strategy and action plan for a proposal to be made to German authorities to improve access to the German housing market for the Canadian housing system.

CMHC Project Officer : Louis Musto

CIDN : 1809 0900001

Division : Canadian Housing Export Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

CONTRIBUTION TO A STUDY ON PACIFIC RIM MARKETS FOR TERMITE-RESISTANT WOOD PRODUCTS

The objective of this project is to study the Pacific Rim markets for termite-resistant wood products.

CMHC Project Officer : Jay Thakar

CIDN : 2104 0900001

Division : Canadian Housing Export Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

CRITERIA TO HELP FORGE SUCCESSFUL CANADIAN HOUSING ALLIANCES

The purpose of this project is to develop and validate criteria to help determine what makes alliances successful in the housing export market.

CMHC Project Officer : *Louis Musto*

CIDN : *1770 0900001*

Division : *Canadian Housing Export Centre*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

DEVELOPMENT OF A FRAMEWORK FOR CODES, STANDARDS AND CERTIFICATION FOR THE USE OF CANADIAN HOUSING TECHNOLOGY AND PRODUCTS IN RUSSIA

The purpose of this project is to provide a standard base for family house building development, including row houses, in the cities of the Russian Federation in accordance with the main directions of the 'Zhilische' housing program.

CMHC Project Officer : *Anjela Pavlova*

CIDN : *2145 0900001*

Division : *Canadian Housing Export Centre*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

ESTABLISHING POLAND REAL ESTATE FUND

The purpose of this project is to assess the feasibility of establishing a Poland Real Estate Fund.

CMHC Project Officer : *Mietka Zieba*

CIDN : *2205 0900001*

Division : *Canadian Housing Export Centre*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

EVALUATION OF CODES, REGULATIONS, DESIGN & BUILDING METHODS IN PRIORITY MARKETS (USA, RUSSIA, SOUTH KOREA, CHILE)

Canadian exporters of pre-packaged housing and components can compete in off shore markets if they can understand and access their market. Exporters must negotiate foreign markets, regulatory systems and familiarize themselves with local design practices and construction technologies, interpret the local vernacular and housing preferences and then market and distribute their product. The first step in managing these obstacles is to fully understand them so that strategies can be developed to overcome them. Some of this information has already been researched or is in the process of being researched by CMHC and other agencies such as DFAIT, NRCan and NRC. In other cases, especially in emerging markets, little information is available to guide exporters.

CMHC Project Officer : Rob Duncan

CIDN : 1949 0200002 (USA)

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

EXPORT HOME SEISMIC SLAB FOUNDATION

The purpose of this project is to identify and develop a new seismic resistive foundation system for use in Japan, which could be "packaged" with Canada's housing technology and exports to create a value-added and thus more attractive export housing product.

CMHC Project Officer : Rob Duncan

CIDN : 2019 0200001

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

EXPORT PERFORMANCE AND NEEDS OF THE CANADIAN MANUFACTURED HOUSING INDUSTRY

The objective of this research is to develop a statistical profile and to identify the export performance and needs of the Canadian manufactured housing industry.

CMHC Project Officer : Louis Musto

CIDN : 1909 0900001

Division : Canadian Housing Export Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

FEASIBILITY STUDY ON AFTER-SALES SERVICES AND ESTABLISHMENT OF A WAREHOUSE FOR CANADIAN HOUSING EXPORTS IN JAPAN

The objectives of this project are to identify existing programs for after-sales services; to provide options for after-sales services; to study Japanese laws and regulations governing the establishment of a warehousing facility in Japan by a foreign company; and to do a cost-benefit analysis for the recommended option.

CMHC Project Officer : Jay Thakar

CIDN : 2056 0900001

Division : Canadian Housing Export Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

FEASIBILITY STUDY TO BUILD A DEMONSTRATION HOUSE IN THE UNITED KINGDOM

This project's objective is to determine the potential market for Canadian woodframe housing and the feasibility of building a demonstration house in the United Kingdom.

CMHC Project Officer : Louis Musto

CIDN : 2099 0900001

Division : Canadian Housing Export Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

GENERAL ASSESSMENT OF HOUSING FINANCE SYSTEMS AND OPPORTUNITIES IN THE MIDDLE EAST

This project's objective is to do a general assessment of housing finance systems and opportunities in the Middle East, and prepare a strategic business development strategy that will enable CMHC to create a network and market its products and services in the Middle East.

CMHC Project Officer : Louis Musto

CIDN : 2165 0900001

Division : Canadian Housing Export Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

HOUSING MARKET IN THE UKRAINE AND MARKETABILITY OF WESTERN CANADIAN CONSTRUCTION PRODUCTS IN THE UKRAINE

The purpose of this project is to assess the housing market in the Ukraine and to research the marketability of western Canadian construction products in the Ukraine.

CMHC Project Officer : *Mietka Zieba*

CIDN : *2179 0900001*

Division : *Canadian Housing Export Centre*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

HOUSING MARKET INTELLIGENCE STUDY OF JAPAN

Japan is one of the world's largest housing markets - housing starts averaged 1.5 million dwelling units annually during 1994-1997 period. This level of annual Japanese housing starts exceeds that of the United States over the same period (1.4 million) and dwarfs the 134,000 average annual starts in Canada.

Much of the market for housing products and services in Japan relates to the construction of single-family housing, which comprises roughly half of the country's total annual housing starts. Many countries including Canada are aggressively targeting Japan as a market for housing-related exports.

Access to market information and research expertise represents an important barrier to Canadian housing firms that are seeking to explore export opportunities in Japan.

This report comprises Phase 1 of a two-phase attempt to assist in this regard. Commissioned by the Canadian Housing Export Centre (CHEC) within Canada Mortgage and Housing Corporation (CMHC), the report highlights the availability, sources and quality of housing market information in Japan. The intent is to inform the Canadian housing industry about how to access important information on the Japanese market.

The Phase 2 study will provide an analysis of prospects for Canadian exports and an analysis of the penetration of imports into this market.

Ottawa: Canadian Housing Export Centre, Canada Mortgage and Housing Corporation, 1999.

STATUS : *Completed Report*

AVAILABILITY : *Available in PDF file on CMHC's Web site. To download this 47 page document visit CMHC's Web site at www.cmhc-schl.gc.ca, click on the Export Opportunities section and browse through the library.*

INDIA MARKET STUDY

The objective of this project is to study the market for Canadian housing industry in India, i.e. manufacturers of products related to housing, prefabricated housing, on-site builders and renovators, and professional services.

CMHC Project Officer : Jay Thakar

CIDN : 2049 0900001

Division : Canadian Housing Export Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

INTERNATIONALISATION DE LA FILIÈRE HABITATION: UNE ANALYSE PERCEPTUELLE

In the rush of the global trade, an increasing number of Canadian firms are looking to foreign markets, and the housing industry is no exception. As domestic demand is down over previous years, prospecting new markets outside the country, is an avenue firms are increasingly less hesitant to explore. To date, however, the housing industry does not have its rightful share of exports, given its size in the Canadian economy.

This study is primarily a qualitative study based on about forty extensive interviews of corporate executives operating in three sub-sectors of the housing industry: professional construction services (builders, engineers, architects, etc.), manufacturers of building products and manufacturers of pre-fab homes. The interviews were conducted with firms from all corners of Canada. The purpose was not so much to identify the objective export-related difficulties as it was to see how corporate executives perceived these difficulties.

The study's conclusions are the following:

1. Firms generally tend to underestimate the difficulties, constraints and barriers related to international commerce.
2. For business, one of the main challenges in international business is delivering the product and the service within the required timeframes.
3. Corporate executives do not fear market globalization.
4. Few firms are concerned with diversifying their markets.
5. Businesses in the housing sector are not very familiar with the competition in target markets abroad.
6. Building systems which use wood have a harder time penetrating foreign markets.
7. Firms are reserved with respect to government assistance.

Prepared by François Cadotte. CMHC Project Officer: Joanne Hallé. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

STATUS : *Completed Report*

AVAILABILITY : *Canadian Housing Information Centre*

Canada Mortgage and Housing Corporation

700 Montreal Road

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INVESTIGATION OF CO-VENTURES AND EXPORT POTENTIAL FOR BUILDING PRODUCTS AND MATERIALS RELATED TO SUSTAINABLE DEVELOPMENT IN CHINA

The purpose of this project is to explore the opportunities that exist in China for co-ventures and the export of Canadian products, technology and materials related to sustainable development to lower the impact on the natural environment and/or promoting a healthy indoor environment.

CMHC Project Officer : Jay Thakar

Division : Canadian Housing Export Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

RESEARCH ON HOUSING EXPORT OPPORTUNITIES IN FRENCH-SPEAKING COUNTRIES AT THE 1999 FRANCOPHONE SUMMIT

The purpose of this project is to undertake and conduct research to determine housing export opportunities in French-speaking countries and at the 1999 Francophone Summit.

CMHC Project Officer : Louis Musto

CIDN : 2171 0900001

Division : Canadian Housing Export Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

RETROFITTING RUSSIA'S HOUSING STOCK: OPPORTUNITIES AND OBSTACLES FOR CANADIAN EXPORTERS

The purpose of this project is to identify several basic business development strategies which could be employed by Canadian firms to practically and realistically respond to the market opportunities represented by the Russian housing sector.

CMHC Project Officer : Oliver Drerup

CIDN : 1830 0200001

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

SEMINAR CURRICULUM ON THE CANADIAN HOUSING SYSTEM AND THE ESTABLISHMENT OF AN INTERNATIONAL TRAINING TEAM

The objective of this project is to develop a seminar curriculum on the Canadian housing system to establish an international training team.

CMHC Project Officer : *Louis Musto*

CIDN : *1973 0900001*

Division : *Canadian Housing Export Centre*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

STUDY OF FACTORY-BUILT HOUSING MARKET OPPORTUNITIES IN SOUTHEASTERN U.S.A..

The purpose of the first of this two-part study was to investigate the potential niche markets open to Canadian manufacturers of factory-built housing in the Southeastern United States. Produced in late 1998, the report provides a substantive examination of the housing markets in Alabama, Georgia, Mississippi, North and South Carolina, and Tennessee. The author of the report states that these specific housing markets were targeted because this particular geographic area is experiencing strong economic growth and that this market is currently a fragmented residential construction market.

Data were collected through research tools such as telephone and personal interviews, analysis of previous research and demographic information on the primary geographic market.

The research reveals there is a growing market for wall panels, as well as timber frame and log homes. A number of US builders interviewed for this project expressed an interest in developing a working relationship with Canadian manufactured housing firms.

Ottawa: *Canadian Housing Export Centre, Canada Mortgage and Housing Corporation, 1999.*

STATUS : *Completed Report*

AVAILABILITY : *Available in PDF file on CMHC's Web site. To download this 58 page document visit CMHC's Web site at www.cmhc-schl.gc.ca, click on the Export Opportunities section and browse through the library.*

STUDY OF THE MIDWEST BUILDING PRODUCTS MARKET IN THE REGIONS OF ILLINOIS, WISCONSIN AND MISSOURI

The purpose of this project is to undertake a study to provide Canadian companies with a general overview of the market forces within the building products sector in the three state regions of Illinois, Wisconsin, and Missouri.

CMHC Project Officer : Louis Musto
Division : Canadian Housing Export Centre
AVAILABILITY : Publication is not available

CIDN : 2172 0900001
STATUS : Ongoing Project

STUDY TO IDENTIFY AND PROFILE CANADA'S HOUSING EXPORTERS AND PROSPECTIVE EXPORTERS IN ATLANTIC CANADA

The purpose of this project is to develop a database of Atlantic Canadian firms in the housing sector involved in or interested in exporting opportunities and to collect descriptive information on the firms identified.

CMHC Project Officer : Charles MacArthur
Division : Canadian Housing Export Centre
AVAILABILITY : Publication is not available

CIDN : 2152 0900001
STATUS : Ongoing Project

SURVEY OF CANADIAN HOUSING-RELATED EXPORTERS AND POTENTIAL EXPORTERS

The purpose of this project is to carry out a quantitative study among companies that are either current or potential housing-related exporters.

CMHC Project Officer : Louis Musto
Division : Canadian Housing Export Centre
AVAILABILITY : Publication is not available

CIDN : 2175 0900001
STATUS : Ongoing Project

SUSTAINABLE DEVELOPMENT IN CANADA

The objective of this project is to investigate the application of Canadian sustainable development in the Japanese market.

CMHC Project Officer : Jay Thakar
Division : Canadian Housing Export Centre
AVAILABILITY : Publication is not available

CIDN : 2092 0900001
STATUS : Ongoing Project

DEMAND PROFILES FOR HIGHER-DENSITY HOUSING

This study examines the relationship between building types as defined by the relative density of projects and household characteristics. It uses the 1991 Census Public Use Micro Data Files (PUMF) to identify the characteristics that distinguish the demand for four types of dwellings:

- the single-family house;
- the duplex, row, semi-attached and attached options that will be referred to as the duplex and townhouse option;
- the under five-storey apartment building; and
- the highrise apartment.

It considers households as formed by couples with children, couples without children, lone parents, and people living alone or with other unrelated people.

The aim is to develop profiles describing the characteristics of households generating the demand for units in higher-density building types and to identify target populations whose entry into the medium-density housing options would contribute most to the goal of making our cities more compact while maintaining a reasonable level of risk in the marketing of units.

The study starts by examining the 1991 census data to describe the households and housing options of Ottawa residents. It links the propensity of the different household types to occupy each of the four buildings types with the Canada Mortgage and Housing Corporation (CMHC) long-run projections of households for the Ottawa region. These projections form a basis for the discussion of how changes in income and housing prices may affect future demand. The role of the existing stock is discussed and a base-line projection developed for the proportion of future housing starts that will be in higher-density buildings. The study concludes by describing household profiles that can serve as targets for the development of new higher-density housing options.

Prepared by Andrejs Skaburskis. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Fanis Grammenos. Ottawa: CMHC, 1999. (Housing Affordability and Finance Series)

Order number: PE0341 **Price: \$12.95 + GST and handling charges.

STATUS : Completed Report

AVAILABILITY : CMHC Information Products

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EMPLOYMENT AND HOUSING ACTIVITY: A CYCLICAL ANALYSIS

The objective of this project is to review the economic literature, prepare an estimation strategy, analyze the past cycles of retained employment indicators and estimate the elasticities of housing starts and MLS sales in relation to the employment indicators.

CMHC Project Officer : Louis Trottier

CIDN : 1952 1000002

Division : Market Analysis Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

HOME PRICES: LONG-TERM DETERMINANTS AND PROSPECTS

The objective of this project is to examine the following types of questions related to the long-term determinants and prospects for home prices: (1) What does current expert opinion say about long-term price trends in Canada? (2) What does the historical experience of Canadian and other housing markets suggest about future price trends? (3) According to current econometric literature, what factors principally govern long-term movements in home prices? (4) How are these determinants expected to evolve over the next twenty-five years? (5) Is there reason to believe that home prices will fall over the next twenty-five years? (6) How credible is this view in comparison to other scenarios? (7) What are the main weaknesses in our current understanding of long-term price movements?

CMHC Project Officer : Ian Melzer

CIDN : 1961 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

HOUSING MARKETS IN BC'S RESOURCE TOWNS: CASE STUDIES FROM THE 1980'S TO THE 1990'S

The purpose of this project is to undertake a detailed study of the housing markets in the following resource towns: Prince George, Prince Rupert, Port Alberni, Trail, Fort St. John and Kelowna, over the period 1976 - 1996, in an effort to model the leads and lags in the local resource economies.

CMHC Project Officer : Joel Starkes

CIDN : 2072 1000001

Division : Market Analysis Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

HOUSING MARKET

HOUSING TRANSITION IN SINGLE INDUSTRY 'INSTANT TOWNS'

This research project examines the local housing market in two single industry "instant towns" in Canada with the purpose of tracking transitions within the local housing market as the economic fortunes of the local industry and community changes through time. The research is intended to provide an increased awareness and understanding of these isolated and potentially vulnerable housing markets to public policy makers, resource corporations contemplating such developments, "instant town" communities and their resident households.

CMHC Project Officer : David Scherlowski

CIDN : 2144 0200004

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

SEMIOMETERING STUDY

The purpose of the study is to segment the market on the basis of new home buyers and existing home buyers. The segmentation will be done in relation to the values and beliefs of each group.

CMHC Project Officer : Bruno Duhamel

CIDN : 2188 1000001

Division : Market Analysis Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

HOUSING SURVEYS

REVIEW OF DATA SOURCES AND INDICATORS

The purpose of this project is to undertake a review of the major national data sources that include housing information which will assist in examining the role each might play in monitoring housing and community trends and developing related indicators.

CMHC Project Officer : Roger Lewis

CIDN : 1988 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

ALTERNATIVE METHODS OF FINANCING MUNICIPAL INFRASTRUCTURE

This study looks at municipal infrastructure finance - the evolution of the issues, the challenges facing municipalities, and different financing methods. The paper evaluates infrastructure financing mechanisms that are alternative or supplementary to government financing. It is intended to serve as a backgrounder for two other studies which examine issues related to provision of municipal infrastructure.

CMHC Project Officer : David D'Amour

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

PROVISION OF MUNICIPAL INFRASTRUCTURE THROUGH DEMAND MANAGEMENT: GUIDEBOOK AND CASE STUDIES

This study looks at the ability of "demand management" (DM) measures to contribute to meeting future water and wastewater infrastructure demands. DM focuses on why demand peaks occur and how to reduce them. The study describes DM techniques, identifies how to tailor programs to community needs, and introduces tools for planners, engineers, and administrators to reduce water use and wastewater flow by reducing leaks, inflow and infiltration. The guidebook discusses the engineering considerations of water and wastewater conveyance and treatment systems which assist in ensuring that public health and the environment are protected. It provides a balanced perspective of DM considering risks, effectiveness, and costs. Case studies profile DM initiatives in communities in Ontario, Saskatchewan, Alberta and British Columbia.

CMHC Project Officer : David D'Amour

CIDN : 1916 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

PUBLIC-PRIVATE PARTNERSHIPS IN MUNICIPAL INFRASTRUCTURE

This paper is the third in a series of three CMHC studies looking at infrastructure finance. The study looks at the impacts of public-private partnerships on service costs and quality and examines whether privatization reduces costs to existing and new homeowners. It looks at different partnership models, discussed their strengths and weaknesses and presents a number of case studies, shedding light on which are most appropriate under which conditions.

CMHC Project Officer : David D'Amour

CIDN : 1788 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

INVESTIGATION INTO THE CAUSES OF RISING MORTGAGE DEBT AND IMPLICATIONS ON THE MORTGAGE MARKET

This study looks at the rising level of mortgage debt in Canada and its implications. The Bank of Canada has noted, with some concern, the rising level of household debt in general and mortgage debt in particular. CMHC has attributed the rise in the latter to mortgages on other than primary residences, and has pointed out that aggregate trends do not take into account the correlation between debts and corresponding assets. By the same token, the National Housing Act (NHA) was changed in 1992 to allow residential mortgages of 95 per cent of the lending value, and first-time owners are allowed to use some of their Registered Retirement Savings Plan (RRSP) funds. These changes should have increased the aggregate demand for mortgage loans. This study extricates the statistical evidence related to growth in mortgage debt and interprets what the trends are indicating.

The study found:

- Despite the rising level of consumer debt, the state of the household balance sheet, on a national accounts basis, is wrong.
- The rising level of consumer debt is principally due to a rising level of mortgage debt, almost exclusively loans by the chartered banks. However, included in the mortgage debt numbers is an unknown quantity, which represents rental properties, cottages, nursing homes, retirement communities and other non-primary residences. A conservative estimate of these portions, taken together, would be approximately one third, in line with the tenure breakdown of the housing stock.
- Despite the use of an estimate of household mortgage indebtedness inflated by mortgages on properties other than principal residences, the mortgage loans outstanding remain well secured by the housing wealth of the country, which continues to rise, albeit at a more modest pace than in previous decades.
- At the household level, using data from the FAMEX from 1982 to 1992, there is no evidence that households have become appreciably more mortgage-indebted over that period. The 1996 survey, when it becomes available, will show the effect of the program-driven, high-ratio mortgages on the overall picture.
- According to industry sources interviewed for this study, credit, is to some extent, supply-enabled, in the sense that the availability of credit and its terms and conditions help shape the debt load assumed by individuals and households.
- There is no evidence of a direct link between high aggregate mortgage debt and the rising level of bankruptcy. Homebuyers who go bankrupt are most likely to be first-time buyers with unresolved debt management issues.
- Finally some portion of the growth in aggregate debt could be expected given the underlying demographics - the baby boom generation has been moving through its peak borrowing years. At this group moves into its saving period, a smaller group will replace it. At the same time, the baby boom generation also stands to inherit a substantial amount of wealth from its prewar parents' generation. The conjuncture of these elements should mean that the high consumer debt will start to decrease.

STATUS : Completed Report

AVAILABILITY : Canadian Housing Information Centre

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MANAGING THE RISKS ASSOCIATED WITH A REVERSE EQUITY MORTGAGE (REM) LOAN INSURANCE PORTFOLIO

The purpose of this project is to complete a study on the management of risks associated with an insured reverse equity mortgage (REM) portfolio.

CMHC Project Officer : Brian Davidson

CIDN : 1728 0100002

Division : Policy and Marketing

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

MORTGAGE AND INTEREST RATES MODELING AND FORECASTING

The purpose of this research is to review and evaluate current approaches and practices to modeling and forecasting mortgage and interest rates, and to construct a set of models to provide CMHC with accurate forecasts of these rates.

CMHC Project Officer : Ali Manouchehri

CIDN : 1858 100001

Division : Market Analysis Centre

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

PERSONAL FINANCIAL MANAGEMENT FOR HOME OWNERSHIP IN TRANSITIONAL SOCIETIES

The objective of this project is to contribute to the efficiency of the mortgage credit and housing markets of Visegard countries by evaluating the situation which has evolved since 1989 and by making recommendations on what might be done to improve the working of those markets. The project will enable the Canadian housing and financial industries to understand the challenges and opportunities confronting them when dealing with the Visegard markets.

CMHC Project Officer : Doug Dennis

CIDN : 1997 0200001

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

PERSONS WITH DISABILITIES

ACCESSIBLE DOWNTOWN RESIDENTIAL COMMUNITIES: A CASE STUDY OF WINNIPEG, MANITOBA

The purpose of this project is to examine housing and community design needs of persons with disabilities, including the elderly, to determine how these needs could be met in a downtown residential location as part of the revitalization of a downtown area.

CMHC Project Officer : Tom Parker

CIDN : 2017 0200001

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

EXAMINATION OF THE HOUSING CHOICES OF PERSONS WITH DISABILITIES

To have accurate information on the housing choices of people aged 15 and over with mobility and agility disabilities.

CMHC Project Officer : Tom Parker

CIDN : 2144 0200019

Division : Research Division

STATUS : Planned

AVAILABILITY : Publication is not available

EXAMINATION OF THE SUPPORTIVE HOUSING NEEDS OF THE SERIOUSLY MENTALLY ILL IN THE MANITOULIN-SUDBURY DISTRICTS

This External Research study aimed to explore and specify the supportive housing needs, preferences and choices of adults with serious mental illnesses, and in particular to identify similarities and differences among subgroups of this "SMI" population along the lines of geographic location, language/culture, and gender. The study was undertaken in the Manitoulin-Sudbury area of Ontario, where community locales range from urban to rural and remote, and significant proportions of the population are anglophone, francophone and Aboriginal, respectively. One hundred mental health services consumers were interviewed from across the region, plus a cross-section of mental health services providers and representatives of consumer/family support groups. Results indicated that there is a need for supportive housing among all SMI population subgroups regardless of geography, language/culture or gender. The most notable difference among the subgroups was related to geography: consumers living in rural communities outside of the Sudbury district have a higher need for supportive housing because of increased isolation and lack of access to public transportation. Variations by language/culture and gender are also noted in the report although they were not found to be statistically significant in this sample. The report concludes with a series of recommendations to address the identified supportive housing needs.

Prepared by Geneviève Gibbons, David Paquette. CMHC Project Officer: Teresa van den Boogaard. Ottawa: Canada Mortgage and Housing Corporation, 1998. (External Research Program)

STATUS : *Completed Report*

AVAILABILITY : *Canadian Housing Information Centre*

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HOUSING NEEDS OF PEOPLE WITH DISABILITIES

The objective of this project is to provide a profile of the housing characteristics and needs of people with disabilities using data from the 1991 Census and post-censal Health and Activity Limitations Survey (HALS).

CMHC Project Officer : *David Metzak*

CIDN : *1045 0200003*

Division : *Research Division*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

MAJOR MAINTENANCE AND RESIDENTIAL RENOVATION: A SURVEY OF MEANS TO IMPROVE THE ARCHITECTURAL ACCESSIBILITY OF EXISTING BUILDINGS

The objective of this project is to study the extent to which it is possible to integrate architectural accessibility into existing residential buildings during major maintenance or common renovation work planned by an owner.

CMHC Project Officer : *Sophie Bang, Succursale de Montreal*

CIDN : *2021 0200001*

Division : *External Research Program*

STATUS : *Ongoing Project*

Research Division

AVAILABILITY : *Publication is not available*

SPACE EFFICIENT UNIVERSAL DESIGN INNOVATIONS

The objective of this project is to evaluate design innovations which have been developed specifically to enhance access for people who use wheelchairs.

CMHC Project Officer : *Tom Parker*

CIDN : *2009 0200001*

Division : *External Research Program*

STATUS : *Ongoing Project*

Research Division

AVAILABILITY : *Publication is not available*

PROPERTY MANAGEMENT

CURRENT CONDITIONS IN THE RESIDENTIAL PROPERTY MANAGEMENT INDUSTRY

This project is intended to result in a profile of the residential property management industry. It will contain statistical and descriptive information on the size and concentration of the industry, the roles and responsibilities of the key players, and any available data on how the industry is positioned internationally. It is intended to focus on a number of social and economic topics associated with residential property management. Results of the project will determine the nature and depth of associated information gaps and research needs. The project will be of interest to residential property managers.

CMHC Project Officer : David Scherlowski

CIDN : 1966 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

RENOVATION AND INSPECTION

HOMEOWNER MOTIVATION AND INNER CITY REVITALIZATION: AN EXAMINATION OF RELATED FACTORS IN WINNIPEG

The objective of this research is to identify the revitalization process underway (e.g.) incumbent upgrading or gentrification in inner city areas demonstrating a high level of renovation activity. It will identify the factors that lead to neighbourhood decline and, equally, factors that prevent the onset of decline.

CMHC Project Officer : Fanis Grammenos

CIDN : 1277 0200001

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

RENTAL REPAIR AND RENOVATION IN CANADA

This report presents analysis and data highlights from the Rental Repair and Renovation Expenditure Survey (RRRES). Statistics Canada conducted the RRRES on behalf of Canada Mortgage and Housing Corporation (CMHC). Clayton Research Associates Limited analyzed the information for presentation in this report.

Since 1988, through the Homeowner Repair and Renovation Expenditure Survey (HRRES), Statistics Canada has provided annual information on repair and renovation work undertaken by homeowners. However, no comparable information was available for rental units. The main objective of the RRRES, therefore, was to fill this information gap by collecting information on the expenditures made by landlords on repairs and renovations to rental units. The survey covered only private rental units; public housing units were excluded. As well, the survey excludes spending by tenants on rental units.

Respondents were asked to report repair and renovation expenditures (both costs of materials, and contracted work) for the following types of work: additions, renovations and alterations; replacement of equipment; new installations; repairs and maintenance. The RRRES also collected information on housekeeping costs.

In addition to an introduction, the report contains two main sections:

- "Highlights" summarizes key survey results from the RRRES.
- "Comparison to Homeowner Repair and Renovation Spending" compares the estimates of spending on private rental units with estimates for the ownership units from the HRRES.

In addition to the main report, the report contains three appendices:

- Appendix A reproduces the Labour Force Survey Contact Information Form, which was used to screen participants, and the Rental Repair and Renovation Expenditure Survey questionnaire.
- Appendix B discusses the survey methodology in more detail.
- Appendix C presents detailed tabulations for figures in the main report. These include data on the incidence of repair and renovation spending and the average spending per unit by type of work, region, structural type of building and period of construction.

Prepared by: Clayton Research Associates Limited. Project Manager: Patricia Arsenault. Prepared for: Canada Mortgage and Housing Corporation. CMHC Project Manager: Roger Lewis. Ottawa: CMHC, 1998. (Housing Affordability and Finance Series Research Report)

Order number: PE0316 **Price: \$12.95 + GST and handling charges.

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AVAILABILITY : CMHC Information Products

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FEASIBILITY OF CREATING A CANADIAN MULTIPLE-UNIT RENTAL HOUSING DATA BASE

The objective of this project is to assess the feasibility of developing a Canadian multiple-unit rental housing database. To that end, the following four questions will be addressed: (i) Should CMHC initiate the development of a multiple-unit data base? (ii) What opportunities would there be to partner with other organizations? (iii) Should a Canadian initiative be linked in some way with the U.S. effort being managed by the Multifamily Housing Institute? and, (iv) What are the options for proceeding?

CMHC Project Officer : David Scherlowski

CIDN : 2095 0200

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

HOUSING HELP RENT BANK PILOT PROJECT EVALUATION

This project will document and evaluate the Housing Help Rent Bank pilot project in Toronto which provides mediation, relocation, counselling services and rent loans to women and children who are at risk of eviction from housing which is affordable, permanent and habitable.

CMHC Project Officer : Anna Lenk

CIDN : 2091 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

RENTERS AND THEIR HOUSING CONDITIONS: FROM THE 1980s INTO THE 1990s

The purpose of this project is to examine how and why the circumstance of renter households changed over the last fifteen years, with special focus on housing conditions, and the social and economic factors associated with changes in the level and nature of housing need.

CMHC Project Officer : John Engeland

CIDN : 1582 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

REVIEW OF METHODS GOVERNMENTS HAVE EMPLOYED TO SUPPORT PRIVATE RENTAL HOUSING

In the current fiscal environment, the federal and provincial governments have limited resources to use in directly supporting the availability of affordable rental housing and must rely on the private sector to achieve this objective. As part of CMHC's efforts to enhance and broaden the understanding of rental housing, this project examines alternative programs and policies employed by governments internationally to support private rental housing, particularly those programs and policies intended to improve the quality, prolong the life or increase the supply of such housing. The review encompassed initiatives from the U.S., U.K., Western Europe, Scandinavian countries, Australia and Japan. This project will be of interest to property developers, private rental landlords and investors, the construction and renovation industry, mortgage lenders and insurers as well as federal and provincial housing policy analysts.

CMHC Project Officer : David Metzak

CIDN : 1885 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

UNDERSTANDING PRIVATE RENTAL HOUSING INVESTMENT IN CANADA

The key study objectives were:

- To examine the nature and extent of private rental housing investment in Canada;
- To develop a profile of who is investing in private rental housing; and
- To establish a thorough understanding of what investors and lenders consider in their decision-making process.

The ultimate goal of the research was to provide a solid basis from which public and private sector decision-makers can act in an informed manner.

Rental housing can be divided into two broad sectors:

- Private rental housing refers to units owned by private sector investors; the owner or occupants may have received a government subsidy/incentive at some point, but the units themselves remain in the hands of the private sector.
- Social/assisted rental housing includes any publicly owned rental building, including non-profit and co-op buildings.

It is private rental housing which forms the focus of the current study.

Investment in private rental housing can take a variety of forms, including:

- Developing new "purpose-built" rental properties for own portfolio or for sale to other investors;
- Purchasing rental properties from a previous investor (or developer);
- Holding/owning existing rental properties on an on-going, longer-term basis;
- Converting purpose-built owner-occupied or non-residential space to rental tenure - either temporarily or permanently; and
- Upgrading existing rental properties (i.e. renovation/repair work).

This report covers each of these various types of private rental investment to some degree. However, the emphasis of the analysis, particularly with respect to the development of a profile of rental investors, is on what are termed "active" investors - those who invest in new units, or are purchasing existing units.

The study takes a Canada-wide view of private rental investment. Where available, statistical information is presented for the 26 Census Metropolitan Areas (CMAs). In addition, the following

6 major markets have been selected for more in-depth analysis in some instances: Halifax; Montreal; Toronto; Winnipeg; Calgary; Vancouver. These centres were chosen as they are among the largest rental markets, and also provide for a degree of geographic variation.

Prepared by Clayton Research Associates Limited and Fish Marks Jenkins Real Estate Consulting. Ottawa: Canada Mortgage and Housing Corporation, c1999. (Housing Affordability and Finance Series Research Report)

Order number: PE0335 **Price: \$12.95 + GST and handling charges.

STATUS : *Completed Report*

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RESIDENTIAL DEVELOPMENT

ALTERNATIVE PLANNING AND REGULATORY APPROACHES USED IN OTHER COUNTRIES

This study examined international approaches to planning and development regulation, specifically, the use of performance based planning and financial/economic incentives. These approaches provide useful lessons and insights in improving the flexibility and effectiveness of the development environment in Canada. In addition to summarizing existing literature on the topic, the research includes the results of interviews with government, development and academic informants in Australia, New Zealand, the United States and Europe.

CMHC Project Officer : *Steve Mennill*

CIDN : *1775 0200001*

Division : *Research Division*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

COMMUNITY DESIGN: AN ANALYSIS OF DENSITY MEANINGS AND DEVELOPMENT OF A DESIGN TOOL

This research addresses how Land Use Density stipulations can impact and/or interplay with various other system components (such as open space) of community plan-making. It will result in a Sustainable Community Design Tool component that will inform the process of "negotiated urban design" in arriving at midrange density prototypes acceptable to the broad community.

CMHC Project Officer : Doug Pollard

CIDN : 1998 0200001

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

CRITICAL SUCCESS FACTORS ENABLING ALTERNATIVE RESIDENTIAL DEVELOPMENT STANDARDS

The purpose of this project is to study innovative examples of the application of alternative development standards. It will determine what the critical success factors are to enable the new standards to be implemented.

CMHC Project Officer : Doug Pollard

CIDN : 2006 020001

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

ECONOMIC IMPACT OF ANCILLARY HOUSING EXPENDITURES

This study will estimate economic impacts from ancillary forms of economic activity such as financing, transfer of ownership, land development and servicing. The contractor will provide estimates of direct, indirect and induced impacts on aggregate and sectoral employment and GDP from ancillary expenditures associated with residential construction expenditures, sales of newly-constructed dwellings and sales of existing dwellings.

CMHC Project Officer : Orlando Manti

CIDN : 2141 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

ECONOMIC IMPACT OF SECONDARY SUITES ON URBAN INFRASTRUCTURE AND SERVICES

The purpose of this research is to investigate and summarize different approaches for determining the municipal servicing costs, both capital and operating, of secondary suites in established neighbourhoods and new subdivisions, through a literature review and key interviews.

CMHC Project Officer : Steve Mennill

CIDN : 2010 0200001

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

GROW-AS-YOU-GO: A PROGRESSIVE APPROACH TO HOUSING DEVELOPMENT

This study will elaborate and validate a conceptual approach to progressive, or incremental housing development, in order to facilitate the implementation of a concrete demonstration project. The project will summarize the experience of precedents of growth-housing; do an assessment of the number of low income households that could benefit from this approach; determine what regulations would enable its implementation; apply the concept to sites identified by the City of Toronto; and report on the experience of implementation. Publication is expected in the spring of 2000.

CMHC Project Officer : Fanis Grammenos

CIDN : 2144 0200013

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

INFORMATION REVOLUTION AND RESIDENTIAL DEVELOPMENT

The objective of this research is to examine residential development within the context of the information revolution.

CMHC Project Officer : Susan Fisher

CIDN : 2014 0200001

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

INTENSIFICATION IN URBAN AREAS

This report examines the issue of urban intensification in order to deal with population growth pressures and sprawl. Intensification (also referred to as revitalization or re-urbanization) is a counter-sprawl concept intended to slow the trend toward rampant development of greenfield sites on the urban fringe. Recent studies have found that an intensified development form could result in at least 25% reduction in infrastructure costs and a 40% savings in land consumption. Canadian cities need to encourage mixed-use intensification -- including both new jobs and new housing -- in order to assure efficient public transit, to accommodate changing populations, and to ensure sufficient jobs and population to maintain vibrant urban centres.

Computer visualization is employed in this study to project (in "picture" form) the size, shape, location and appearance of proposed developments and their associated density implications. This technology, which combines geographic information systems and computer-aided design software, is used to illustrate the impacts of intensification on neighbourhoods and the potential visual effects of projects that have not yet been built.

This report demonstrates that:

- Residential and mixed-use intensification is already occurring in some Canadian cities;
- Infill and intensification may be (and have been) effectively employed to increase the stock of affordable housing and to revitalize urban centres; and
- Governments and housing providers must re-think the basis for regulatory controls, rigid building and zoning codes, as well as planning mechanisms which impede the production of low-cost housing;
- Intensification has been achieved by a variety of measures; these include design guidelines in lieu of outdated zoning controls, as-of-right zoning to reduce time delays and processing costs, live/work spaces to promote the provision of both residences and jobs in the city, and the use of density bonuses to encourage concentrated development in key locations (such as transit nodes on major arterials) where revitalization is desirable.

Prepared by Gerald Daly, Richard Milgrom. CMHC Project Officer: Fanis Grammenos. Ottawa: Canada Mortgage and Housing Corporation, 1998. (External Research Program)

STATUS : Completed Report

AVAILABILITY : Canadian Housing Information Centre

Canada Mortgage and Housing Corporation

700 Montreal Road

Ottawa, Ontario

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Fax.: 613-748-4069

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International clients see page 9 for order instructions.

RESIDENTIAL INTENSIFICATION IN CENTRAL DISTRICTS

The objective of this research is to examine the phenomenon of residential intensification in a dense urban sector using data on the new housing built there in the last five years and on the new residents of those dwellings. The study will focus on the Mile End neighbourhood of Montreal with the view to drawing lessons for the renewal of central districts in other Canadian cities.

CMHC Project Officer : *Mark Holzman*

CIDN : *2012 0200001*

Division : *External Research Program*

STATUS : *Ongoing Project*

Research Division

AVAILABILITY : *Publication is not available*

RESIDENTIAL STREET DESIGN: LEARNING FROM SUBURBIA

The purpose of this research project is to generate concrete residential street design solutions based upon a thorough understanding of precedents, and to introduce and stimulate new ideas for land developers and design professionals.

CMHC Project Officer : *Fanis Grammenos*

CIDN : *1644 0200001*

Division : *External Research Program*

STATUS : *Ongoing Project*

Research Division

AVAILABILITY : *Publication is not available*

GREENBACKS FROM GREEN ROOFS: FORGING A NEW INDUSTRY IN CANADA

The purpose of this study is to review the benefits of green roofs and vertical gardens, examine barriers to diffusion of technologies in Canada and recommend ways to overcome those barriers.

Green roof and vertical garden technologies offer an outstanding number of public and private benefits including: energy cost savings from increased insulation; increased property values; savings on stormwater infrastructure; air quality improvements; and enhanced aesthetic, health and recreational opportunities.

Barriers to the diffusion of these technologies include: lack of knowledge and awareness; lack of incentives; cost barriers; technical issues; and risks associated with uncertainty. These barriers can be overcome by: compiling a repository of knowledge on the Internet; high profile demonstration projects; government procurement support; government policy and program support; financial incentives such as insurance premium reductions and performance based contracting; and research to address information gaps.

Prepared by Steven W. Peck, Chris Callaghan, Brad Bass, and Monica E. Kuhn. CMHC Project Officer: Susan Fisher. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

STATUS : Completed Report

AVAILABILITY : Canadian Housing Information Centre

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Ottawa, Ontario

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International clients see page 9 for order instructions.

HOUSING FOR OLDER CANADIANS: THE DEFINITIVE GUIDE TO THE OVER-55 MARKET

Canada's older market - 55 and older - is healthier, more active, more informed, more affluent and more demanding than ever before. "Housing for Older Canadians" is the definitive guide for individuals and organizations who want to design, develop, market, manage and sponsor housing for the "over-55" market. Parts of this book will also be useful for support-service providers and for organizations representing older people and who want to help their members find appropriate housing solutions. The guide is tailored to Canadians, and draws on experiences from Canada and other countries, such as the United States.

Ottawa: Canada Mortgage and Housing Corporation, 1999.

Order number: NE2184 **Price: \$49.95 + GST and handling charges.

STATUS : Completed Report

AVAILABILITY : CMHC Information Products

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HOUSING OPTIONS FOR PEOPLE WITH DEMENTIA

One disease that can affect older people is dementia. This is a term used for a group of symptoms that affect mental abilities, including: the ability to remember, reason, make decisions, judge and communicate. There are various forms of dementia: the effects of some can be reversed; those of others, currently, cannot. For those people with a progressive type of dementia, specialized care in specialized environments is required to enhance their abilities and quality of life.

This guide sets out to increase public awareness of new housing options for people with dementia and to encourage the development of more community-based solutions. More specifically:

- it describes a range of housing options designed to meet the particular needs of people with dementia;
- it outlines a range of support services that can help caregivers to fulfil their responsibilities;
- it discusses a number of housing management principles that can help in the care of people with dementia; and
- it discusses environmental design considerations for housing people with dementia.

One of the important concepts presented in this guide is that of "residentiality". Very simply, this concerns the importance of creating a home-like setting for those suffering from dementia. The guide discusses two primary options for those suffering from dementia - to remain at home (whether that is a detached suburban bungalow, a condominium apartment or a dwelling unit in a retirement community), or to move into housing specifically designed for people with dementia. For those who can no longer remain at home, the guide presents a number of housing options where persons with dementia can maintain a comfortable sense of living normally.

Ottawa: Canada Mortgage and Housing Corporation, 1999.

*Order number: NE2214 **Price: \$24.95 + GST and handling charges.*

STATUS : Completed Report

AVAILABILITY : CMHC Information Products

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IMPORTANCE DU RISQUE ENVIRONNEMENTAL DOMICILIAIRE DANS LA SURVENUE DES CHUTES CHEZ LES PERSONNES ÂGÉES

Research done in recent years has shown that falls by the elderly are not due to chance and are attributable to a combination of factors pertaining to their physical and psychological state, their behaviour and their physical environment. Contrary to intrinsic factors, the environmental component in the risk of falls, though frequently cited as a contributing cause, has been investigated far less. According to studies published in the past twenty years, it has been estimated that the physical environment accounts for close to one half of the falls which occur in the home. The establishment of an environmental risk level pertaining to elders represents a crucial point in preventing falls. In this study, four objectives were pursued:

- List in order the environmental risk factors which relate to falls based on the opinions of a group of experts;
- Determine the level of environmental risk encountered on a daily basis by the elderly living in their homes;
- Identify high-risk sectors in homes;
- Estimate the correlation between the level of environmental risk and the occurrence of falls.

This study examined residents in the Quebec urban region 65 and over, who are autonomous, active and living in their homes. To ensure a homogeneous sample, participants in the study did not require help to move about (walkers and wheelchairs). Two hundred and eleven appointments were scheduled and 192 visits were made between July 21 and October 6, 1997. The information was essentially collected from two measuring instruments completed by interviewers when they visited, i.e., a checklist of environmental risk elements and a questionnaire dealing with the respondent's characteristics (sociodemographic data, whether they have fallen and their history of falling, the level of activity in the home).

Using a linear measuring scale, a group of experts listed in order the various environmental risk factors. This group consisted of 24 persons and covered three specific areas of interest - health, architecture and retired persons. The respondent had to rate each risk factor by choosing a figure on a linear scale to indicate the importance of the factor.

Prepared by Benoît Lévesque, Isabelle Lamontagne, Pierre Maurice, René Verreault, Suzanne Gingras and Denis Gauvin. CMHC Project Officer: Luis Rodriguez. Ottawa: Canada Mortgage and Housing Corporation 1999. (External Research Program)

STATUS : Completed Report

AVAILABILITY : Canadian Housing Information Centre
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 Ottawa, Ontario
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INTERVENTION MODELS: SAFETY IN CASES OF EMERGENCY OF PERSONS WITH REDUCED MOBILITY AND SENIORS LOSING THEIR INDEPENDENCE LIVING IN REGULAR RESIDENTIAL ENVIRONMENTS

This study is aimed at integrating current knowledge and reflections concerning the problems associated with the safety of seniors and persons with disabilities living in regular residential environments, in order to apply them to the development of intervention models for three multiple-family buildings equipped with elevators.

CMHC Project Officer : Luis Rodriguez

CIDN : 1460 0200001

Division : External Research Program
Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

LIVING AT HOME OR IN A RESIDENCE: A CHALLENGE FOR SENIORS AND WORKERS

The objective of this project is to examine, in Quebec's Saguenay area, the circumstances, constraints, limitations and difficulties encountered by clients who receive home care and the organizations that provide it.

CMHC Project Officer : Luis Rodriguez

CIDN : 1641 0200001

Division : External Research Program
Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

MEETING SENIORS' HOUSING NEEDS: A GUIDE FOR COMMUNITY GROUPS

The purpose of this guide is to help organizations, such as service clubs, religious organizations, ethnic organizations, neighbourhood groups and retiree organizations, to understand how they can influence the provision of seniors' housing in their communities.

CMHC Project Officer : Steve Mennill

CIDN : 1747 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

PLANNING HOUSING AND SUPPORT SERVICES FOR SENIORS

In 1991, Canada Mortgage and Housing Corporation (CMHC) published *Maintaining Senior's Independence in Rural Areas: A Guide to Planning for Housing and Support Services*. It was intended to assist rural communities in determining seniors' needs and preferences for housing and support services, and to identify options for meeting them. The publication was based on the results of a study carried out for CMHC's Research Division by Dr. Gerald Hodge and Dr. Gloria Gutman of the Gerontology Research Centre at Simon Fraser University.

Soon after the publication's release, it became evident that it was being used widely across Canada in both rural and urban communities, by people representing a variety of disciplines in the public, non-profit and private sectors. The feedback these users have provided over the past seven years has resulted in a number of improvements to this new edition.

These include modifying the major survey instruments; developing a new section on ways of selecting sample surveys; replacing the section that deals with population data; and complementing the manual tally book with a computerized tallying program. In addition, the focus of the guide has changed to include discussions and considerations that reflect the needs of users in urban as well as rural areas.

This publication was designed to help communities anticipate and plan for the present and future housing needs of seniors while incurring minimal expenses. The publication:

- Provides general information on the aging process in Canada;
- Provides an information model and complete instructions for assessing the housing and support service needs;
- Contains questionnaires, worksheets and reporting forms to gather and analyse facts, as well as step by step instructions for their use.

A computerized version of this guide is available from CMHC under the title *SENIORS*. It comprises a set of instructions; a set of survey instruments; and a set of analytical routines to facilitate analyses and planning, as well as routines to facilitate reporting. Other features include the ability to export data for transfer to a regional centre for aggregation with data from other community studies, and the ability to combine data at a regional level. *SENIORS* also contains a built-in population file by age group and sex that is customized for specific communities across Canada.

Ottawa: Canada Mortgage and Housing Corporation, 1999.

*Order number: NE2014 **Price: \$44.95 + GST and handling charges.*

STATUS : Completed Report

AVAILABILITY : CMHC Information Products

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PREDICTING THE ADJUSTMENT OF ELDERLY PERSONS TO CONGREGATE CARE HOUSING

The objective of this research was to develop a preliminary model for predicting how older people would adjust to congregate housing.

CMHC Project Officer : Luis Rodriguez

CIDN : 1827 0200001

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

PRIVATE RENTAL MARKET: ADAPTING TO THE NEEDS OF AGING TENANTS

This research will identify the extent to which landlords in the private rental market across Canada are accommodating the needs of aging tenants, and describe and develop measures that would help landlords deal more effectively with tenant needs.

CMHC Project Officer : Luis Rodriguez

CIDN : 1996 0200001

Division : External Research Program

STATUS : Ongoing Project

Research Division

AVAILABILITY : Publication is not available

STUDY OF SPATIAL ORIENTATION IN A RESIDENTIAL COMPLEX FOR SENIORS WITH OR WITHOUT COGNITIVE DISORDERS

The general purpose of this research project is to obtain spatial orientation design criteria that will make it possible to work on the architectural environment of residential complexes for seniors. The analysis concerns three typical residential complexes.

CMHC Project Officer : Luis Rodriguez

CIDN : 2144 0200017

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

SENIORS

SUPPORTIVE HOUSING FOR SENIORS

The objective of this project is to undertake research and develop the manuscript of a new CMHC publication on supportive housing for seniors. This housing option is increasingly important to fulfill the demand for housing with on-site or readily accessible social and medical support services.

CMHC Project Officer : Luis Rodriguez

CIDN : 2103 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

USER SATISFACTION STUDY OF HOUSING OPTIONS FOR OLDER CANADIANS

The objective of this research is to carry out user satisfaction studies of some of the newer housing options that are currently available to older Canadians, and to produce an objective and detailed report based on the results of the research.

CMHC Project Officer : Luis Rodriguez

CIDN : 1583 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

SUSTAINABLE DEVELOPMENT & HEALTHY HOUSING

MEASURING STICK: SOCIAL SUSTAINABILITY IN MULTI-UNIT HOUSING

This project will develop indicators that will measure the quality of life as it is affected by features of housing in three different multi-unit urban neighborhoods. These indicators will be then used to design and test a survey instrument aimed at capturing the social and physical attributes of housing as they pertain to sustainable urban communities.

CMHC Project Officer : David Scherlowski

CIDN : 2144 0200003

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

MULTIPLE HOUSING FOR COMMUNITY SUSTAINABILITY

This project produced information to assist developers and municipalities in developing land at higher than current average densities by means of multiple housing forms. It assembled and developed exemplary multiple housing solutions and assessed consumer demand for these. It also identified market segments and strategies to attract them to medium density housing. The report provides advice on the likely clients for medium density, multiple housing and on project design attributes that will entice them to choose medium density (townhouses and walk up apartments) over single detached housing.

CMHC Project Officer : Fanis Grammenos

CIDN : 1628 0300001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

SUSTAINABLE COMMUNITY INDICATORS PROGRAM (SCIP) SOFTWARE

The objective of this project is to develop a computer software program designed to assist communities in developing and using indicators to measure their progress toward community sustainability. The sustainable community indicators program (SCIP) software is aimed at helping communities to: select, create and use indicators for monitoring and reporting on local sustainability; promote the use of comparable indicators both locally and at the national level; and exchange indicators and related data with other communities.

CMHC Project Officer : John Engeland

CIDN : 1796 0200003

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

URBAN TRANSPORTATION

DESIGN GUIDELINES FOR REGIONAL ROAD CORRIDORS

The purpose of the study is to develop new guidelines to encourage regional road corridors that are safe and easy to access for pedestrians and that are pleasant places for neighbourhood interaction. These corridors should function as public spaces that link communities and enhance living conditions for households within those communities.

CMHC Project Officer : Susan Fisher

CIDN : 2203 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

IMPACT OF URBAN FORM AND TRAVEL ACCESSIBILITY ON PRIVATE VEHICLE USE

The purpose of this study is to measure the influence of land use patterns and urban form on household travel demand and behaviour. Using household travel survey data from the City of Edmonton, multiple regression analyses were conducted to examine the influence of factors such as: household income and size; accessibility measures by walk, cycle, transit and auto; density and road patterns.

CMHC Project Officer : Susan Fisher

CIDN : 1752 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

METHODOLOGY TO ASSESS TRANSPORTATION GREENHOUSE GAS EMISSIONS FROM URBAN TRAVEL

The purpose of this study is to compare the greenhouse gas (GHG) emissions from personal urban transportation given variations in community planning and design variables such as density and land use mix. The final product will be a software tool that would be used by CMHC and its clients to evaluate development proposals for GHG emissions from urban travel. In the study, the software is used to compare the GHGs from urban travel of nine neighbourhood scenarios, each with different design features and locations.

CMHC Project Officer : Susan Fisher

CIDN : 2041 0200001

Division : Research Division

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

CANADIAN WOMEN AND THEIR HOUSING: 1997

The specific objective of this research study is to provide a profile and analysis of women, health and well-being related to housing issues in the 1990s. This report, building on and updating a 1983 report *Women as Housing Consumers*, is intended to provide information for use by academics, students, researchers, planners and housing policy-makers at municipal, provincial, and federal levels, and women generally. The study is also intended to suggest future directions for research, policy and dialogue with regards to healthy housing for women.

Prepared by: SPR Associates Inc. Prepared for Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1998.(Housing Choices Series.)

Order Number PEO313 ** Price \$12.95 + GST and handling charges.

STATUS : Completed Report

AVAILABILITY : CMHC Information Products

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INVESTIGATION OF ISSUES FOR THE EVALUATION OF THE NEXT STEP PROGRAM

The purpose of this project is to conduct a literature review on second-stage housing for the Next Step Program.

CMHC Project Officer : Patricia Streich

CIDN : 1507 0500001

Division : Audit and Program Evaluation Services

STATUS : Ongoing Project

AVAILABILITY : Publication is not available

HOUSING CANADA'S YOUTH

The objective of this project is to develop social, economic, and demographic profiles of youth with an in-depth review of their current and past housing conditions, and identification and assessment of housing issues and trends into the future. The youth and rental repair studies should be out by the end of the year.

CMHC Project Officer : *Gloria Neufeld Redekop*

CIDN : *1786 0200001*

Division : *Research Division*

STATUS : *Ongoing Project*

AVAILABILITY : *Publication is not available*

- Alternative mortgage instruments / Nouveaux modes de financement hypothécaire*
(Rev. 15 p., October/octobre 1984)
- Architecture in Canada / L'architecture du Canada*
(18 p., July/juillet 1983)
- Building and climatic factors / Construction et des éléments climatiques*
(7 p., November/novembre 1983)
- Building in cold climates / Construction dans les pays froids*
(Rev. 9p., December/décembre 1989)
- Building laws / Législation de la construction*
(Rev. 25 p., October/octobre 1986)
- Building materials / Matériaux de construction*
(14 p., August/août 1987)
- Building product information / Information sur les produits pour le bâtiment*
(7 p., August/août 1984)
- Children in the urban environment / Les enfants dans le milieu urbain*
(23 p., January/janvier 1993)
- Cohousing / Habitation communautaire*
(8p., July/juillet 1996)
- Computer-aided architectural design / Dessins architecturaux par ordinateur*
(Rev. 2 p., September/septembre 1984)
- Condominium conversion / Immeubles d'habitation - transformation en copropriétés*
(12 p., May/mai 1986)
- Condominiums / Copropriétés*
(Rev. 12 p., March/mars 1986)
- Congregate housing / Habitat collectif*
(10 p., November/novembre 1991)
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(Rev. 27 p., January/janvier 1988)
- Construction industry labour / Main-d'oeuvre de la construction*
(6 p., February/février 1988)
- Cooperative housing / Coopératives de logements*
(Rev. 40 p., September/septembre 1988)
- Crime prevention and architectural design / Design architectural et prévention de la criminalité*
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- Deinstitutionalization*
(7 p., June/juin 1988)
- Desktop Publishing*
(3 p., March/mars 1988)

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(8p., December/décembre 1985)

Discrimination and segregation in housing in Canada / Bibliographie sur la discrimination et la ségrégation dans le logement au Canada

(5p., November/novembre 1991)

Downtown redevelopment / Réaménagement de centres-villes

(Rev. 26p., January/janvier 1989)

Earthquakes and construction / Tremblements de terre et construction

(20 p., March/mars 1995)

Energy conservation in multiple housing / Économie d'énergie dans les logements collectifs

(Rev. 3p., June/juin 1983)

Examples of housing program evaluations / Exemples d'évaluations de programmes de logement

(3p., January/janvier 1982)

Expandable housing / Les logements expansibles

(October/octobre 1985)

Experimental houses / Maisons expérimentales

(6p., January/janvier 1983)

External Research Program Reports arranged by subject / Rapports du programme de recherche à l'extérieur par sujet

(Rev. 65 p., August/Août 1999)

False Creek, Vancouver, British Columbia / False Creek, Vancouver, Colombie-Britannique

(Rev. 4p., November/novembre 1984)

Federal/provincial relations and housing / Relations fédérales/provinciales et le logement

(3p., June/juin 1987)

Foundations / Fondations

(17p., January/janvier 1989)

Geodesic domes / Domes géodésiques

(4p., November/novembre 1983)

Graduated payment mortgages / Prêts hypothécaires à paiements progressifs

(Rev. 3p., October/octobre 1991)

Group homes / Foyers de groupe

(Rev. 5p., May/mai 1986)

Halfway houses / Foyers de groupe

(Rev. 5p., May/mai 1986)

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(3p., April/avril 1982)

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(Rev. 61 p., June/juin 1998)

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(5 p., September/septembre 1993)
- Housing and services for the disabled / Logement et les services pour les handicapés*
(Rev. 68 p., April/avril 1992)
- Housing and the elderly / Le logement et les personnes âgées*
(Rev. 78 p., September/septembre 1988)
- Housing conversion and residential intensification / Conversion d'habitations et intensification résidentielle*
(Rev. 8 p., October/octobre 1990)
- Housing costs / Prix des maisons*
(12 p., August/août 1985)
- Housing demand / La demande en logement*
(22 p., November/novembre 1986)
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(7 p., May/mai 1993)
- Housing for single people / Le logement et les personnes seules*
(3 p., September/septembre 1984)
- Housing for single parent families / Le logement et les familles monoparentales*
(Rev. 6 p., May/mai 1986)
- Housing in Canadian municipalities / Logement dans les municipalités canadiennes*
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- Housing in urban core areas / Logement dans les centres-villes*
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- Housing management / Gestion des logements*
(Rev. 23 p., January/janvier 1989)

- Housing markets / Le marché du logement*
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- Housing quality / Qualité de logement*
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